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THE LESSONS OF FOLKLORE

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The study of folklore is the study of superstitions. Superstitions are opinions which stand over from a lower into a higher state of culture.

There are people who can move their ears at will; the lower animals can do this, but only a few human beings can wink their ears. Organs that are useful in lower species may remain in an imperfect and practically useless state in a more highly developed species; they are then called vestigial organs. As there are vestigial organs, so there are vestigial opinions. These vestigial opinions are commonly called superstitions. When we come to investigate vestigial opinions and treat them as objects of science, we no longer call them superstitions but we call them all folklore.

The science of folklore may be defined as the science of superstitions, or the science of vestigial opinions no longer held as valid. Yet such erroneous opinions that hold over from the days of greater ignorance to the era of modern scientific research are found to be of profound interest in the revelations which they make of the nature of superstitions themselves. We might

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neglect them or seek to substitute for them valid opinions. However, science does not hesitate to investigate any question, and even the natural history of superstitions has come to be a profoundly interesting and instructive science.

Some years ago a movement was made in Europe and America to investigate superstitions themselves on the theory that they are valid. Societies were organized in London, Paris, Berlin, and New York for the purpose of determining whether or not there is substantial truth in error itself. This is the function of the Societies for Psychical Research, the purpose of which is to discover the truth of dreams, the validity of necromancy, and the reality of ghosts. I have a suspicion that the Societies for Psychical Research are rather instrumental in increasing superstitions than in dispelling them, and that we reap the natural fruit of these researches in the increased prevalence of such abnormal cults and arts as christian science, mind healing, spirit rapping, and slate juggling. Be this as it may, there is one result growing out of the modern Societies for Psychical Research which I hail with pleasure: In the transactions of these societies there is put on record a great body of superstitions, all of which are valuable material as folklore.

There is also a great body of material for use in folklore which is usually called mythology. Until of late years mythology has been studied rather for literary purposes, for it has been abundantly used in poetry, as the similitudes, allegories, and tropes of poetry and other kinds of polite literature are derived largely from mythology. From this standpoint mythology has been extensively investigated, and all its material is available for the purposes to which folklore is relegated.

In addition to these subordinate materials, the folklore students of the world are actively engaged in collecting material among all the people of the world. Already these researches are yielding abundant fruit, and the time has come when the facts of folklore can be put into orderly arrangement and the

principles discovered upon which folklore itself may be organized into a science. It is my purpose at this time to present a sketch or outline of this new science.

Remember it is the science of superstitions, and the science must deal with the fundamental errors of mankind (as the phenomena of nature have been interpreted by savage and barbaric peoples), and how these errors as vestigial phenomena have remained over in civilization and are still entertained. Of course the ignorant entertain them by wholesale; but it is not the ignorant alone who entertain superstitions. Superstitions are domiciled in many parlors, they are paraded on many platforms, they are worshiped in many temples, and they lurk even in scientific haunts and appear in scientific publications and are taught by scientific men. There is much folklore in this world, and sometimes it may be found in strange company.

The most fundamental elements of folklore may be set forth in an intelligible manner by explaining the erroneous opinions held by mankind in the stage of savagery about the cosmology of the visible world and about the world of ghosts. I shall therefore try to present the cosmology of savagery with some reference to its appearance in modern times in vestigial forms, and I shall try also to present the savage theory of ghosts and how this theory still remains in vestigial forms in the higher culture which we call civilization.

To the wildwood man who roams the prairie and haunts the forest the world is the grand domicile of beasts. Beasts are men, and men are but beasts. To his mind the beasts are rather superior to men. The beasts have more magical power and hence are oftentimes immeasurably superior to human beings. The savage admires the superiority of the beast and longs for his activities; he is forever contemplating the accomplishment of beasts—the wonders which they can perform—and is envious of their skill in what he supposes to be magic. He sees the trout dart from bank to bank in the brook and is amazed at its magical

powers, and from admiration he often proceeds to adoration. He sees the serpent glide over the rock, swift without feet and having the sting of death in his mouth; in this respect he seems superior to man. He sees the chameleon gliding along the boughs of trees in sport with rainbow hues, and is delighted with its magical skill. He sees the eagle sail from the cliff to the cloud region, at home in wonderland. He sees the lion walk forth to conquer with occult majesty. Yes, all of the animal world is magical and men are but degenerate animals. Inspired with wonder he is filled with adoration, and the beasts are gods. The world is thus the home of men and gods, and the gods are the beasts.

This home itself is a tabernacle of wonderful structure with the sky above and the earth beneath — the sky of solid crystal, the plane of the earth with mountains and valleys, with hills and plains, with forests and prairies, with rocks and deserts, with lakes and rivers. What a tent is this. The blue dome over the green earth, the mighty structure of the solid crystalline sky, a stupendous vault over a vast floor. This is the chamber of the world — a tent with a canopy of heaven and a floor of earth.

In this world sun and stars are but shining magical beasts that travel by appointed paths along the face of the sky. No hint of astronomy has been given to savagery. No scientific research has revealed the structure of the heavenly orbs. The sky as a dome and the earth as a floor constitute a chamber in which dwell the star beasts, the prowling beasts, the bird beasts, the reptile beasts, the fish beasts, and the insect beasts. In this magical temple they are engaged in magical activities. A vast chamber with the sky above and the earth beneath is the theater of a world of magical beings.

Some men there are — so thinks the savage — who also at times have magical powers. These are the shamans, as we often call them, — the priests. They call them *jossakeeds*, or by some other name, for there are a multitude of languages in savagery,

and every language has its name for these wonder-working men. All tribes have jossakeeds, and the savage believes that all tribes of beasts have jossakeeds; even the stars have jossakeeds.

These wonderful beasts, the stars, have to travel by appointed paths along the lower surface of the crystalline dome; but there are stars of greater magical powers — jossakeeds of flashing light — meteors of the sky. So lions have jossakeeds, so eagles have jossakeeds, so humming-birds have jossakeeds, so serpents have jossakeeds, so trees have jossakeeds, and so rocks have jossakeeds. The savage distinguishes between common people and priests, common people and wonder-makers; and trees, rocks, waters, animals, and stars are all common people and priests.

Now, we must see how this world is enlarged in the mind of the savage. There is still the dome above and the world below; but still as men travel from land to land and meet with tribe after tribe and return to tell of their journeyings, gradually the notions about the world are enlarged and men come to talk about the world in terms of direction. They speak of the world above and the world below in reference to the world here or the midworld, for every tribe believes itself to inhabit the center of the world; thus we have a zenith world, a midworld, and a nadir world. Then they speak of a world to the north, of a world to the south, of a world to the east, and of a world to the west, for men think of the world in terms of the cardinal points. Chained to this mode of thinking by the terms of language, the three worlds are multiplied and seven worlds are known: the midworld, the under world, the upper world, the north world, the south world, the east world, and the west world. All tribal peoples, savage and barbaric alike, believe in these seven worlds as departments or pavilions to the world of firmament and earth.

It is still a folk habit among civilized people to classify good and evil by regions. The good is from above and the evil is from below; the good belongs to heaven, the evil to hell. Let us expand this way of classifying things and consider every attribute

as belonging to or coming from one or another of the seven regions. Let us say that the gopher is proper to the lower world, the eagle proper to the sky. Let us classify all birds by regions and all prowling beasts by regions; let us classify trees by regions; let us classify colors by regions. Ah, there we have it, colors are yet classified by regions, and when we speak of seven colors we use the vestigial classification of savagery. Science no longer classifies colors in sevens; but folklore still classifies them in this manner, and this is the classification which has held over since tribal opinions were formed. In tribal society all objects and all attributes as properties or qualities are classified in this seven-fold manner, and every body and every attribute of a body is believed to be proper to some region, so that the idea of seven worlds is extended to all things, for everything is proper to some world. In savagery the folk think of bodies and properties in a cosmological scheme, just exactly as you think that a lie comes from hell and the truth from heaven, as though these qualities were proper or appropriate to a particular region. A man may know that a lie comes from the tongue and is proper to a false heart, yet from immemorial habit he will use the expression, "a lie from hell." As everyone who knows quite well that truth comes from correct reasoning may still affirm that some particular truth in which he is interested is a truth from heaven, so the savage considers that red is from the west world, is the color proper to a particular region. The red of the crest of the woodpecker he believes to be the red of the west world, which is the red sunset. So he will say the red of the west world is on the crest of the woodpecker, as you would say the light of the upper world irradiates the brow of the saint, or as you would say the anger of hell is on the face of the assassin. In like manner it must be understood to be universal in savagery to attribute all bodies, properties, and qualities severally to the cosmical regions.

It is the universal opinion in savagery that the world is a hollow chamber between a solid dome and a flat earth, and that in

this world there are seven regions, — the region where the tribe lives, which is spoken of as a midworld; a region above, or upper world; a region below, or under world; a region to the east, another to the west, one to the south, and one to the north, which are the cardinal worlds, and that everything in nature is assigned to one or the other of these worlds, and everything of which man may speak is proper to or belongs to some world and that it has been derived from that world. It is thus that the cosmology of savagery is the theory of its classification.

In the last stages of savagery and on to early civilization this cosmology is gradually changed into a new theory. The cardinal worlds become cardinal elements. In the primordial cosmology earth, soil, or dirt belongs to the midworld. In the same manner in savagery the air is supposed to be the breath of animals, and so the winds are supposed to come from the cardinal worlds and to be proper to the cardinal worlds; but when the atmosphere is discovered as something universally present and ambient over the surface of the earth, new concepts about the air spring up.

In the same way in savagery fire is proper to or comes from the south in the northern hemisphere, or from the north in the southern hemisphere; but in early civilization men gradually learn that fire is proper to combustible material, and they gradually acquire new concepts about it. Among savage people water belongs to the region of the direction in which the sea was known to the particular tribe; but gradually, in early civilization, men learn that the sea is everywhere beyond the land, and they learn that water is evaporated from the sea and falls upon the land, and gradually they acquire new opinions about water; so earth, air, fire, and water, that once were supposed to be regional things, are gradually transformed into elemental things, and men believe that everything is composed of four substances, — earth, air, fire, and water. They gradually give up their opinions about the cardinal worlds and speak now of cardinal substances, though they still adhere to the three worlds, — the upper world, the midworld, and

the lower world. This is the cosmology of early civilization, in which we find men speculating about the proportions in which earth, air, fire, and water are mixed in the different things. Thus the cardinal regions become cardinal elements. In savagery everything is attributed to some region; in early civilization everything but good and evil is attributed to elements, while good is still attributed to the upper world and evil to the lower world, and we still think of heaven as above and of hell as below — a survival from savagery.

Good comes from the mind of man, not from the clouds; from human purposes, not from heavenly regions. It is not an attribute of space, but an attribute of mind. In the same manner evil is proper to the mind; evil is in the soul. Evil is not devised in hell as a place; it is not an attribute of space, but it is an attribute of purpose. Hell and heaven are in the souls of men. Thinking men clearly understand this, though they may use language which implies that good and evil are properties of space. The ignorant misunderstand this language, and still believe that good is in heaven and evil in hell, and that by magic they come among men.

I say that the sun comes up, though I know that the earth turns down toward the east. This habit of expression does not deceive the astronomer who understands the rotation of the earth upon its axis; but the ignorant man may be deceived thereby. I say that the sun goes down, but the astronomer knows that the earth turns round, and he interprets the expression which I make as a symbol of the truth; but the ignorant man may be deceived. In like manner all folklore is ancient error still believed by the ignorant. Often the ancient errors still remain in the usages of language, but are properly interpreted by wise men. So wise men often say foolish things, but they understand them as symbols, while ignorant men believe them.

All of the bodies of the world — stars, waters, rocks, and plants — are animals, so the tribal man thinks. This doctrine is

hylozoism. Animals live in generations, so he believes that all bodies live in generations, that generation itself is something magical, and that magic is the cause of reproduction. The savage man is forever speculating how this or that thing is generated, or, as they say, Who is the mother of this thing? Who is the mother of the rock? Who is the mother of the rain? Who is the mother of the lake? In this manner they speak of the origin of things.

In barbarism the expression is changed. The barbarian asks, Who is the father of this thing? Who is the father of fire? Who is the father of water? Who is the father of the cloud? Who is the father of the sun? Not only do tribal men speak of bodies having mothers or fathers, but they speak of properties and qualities as having parents, for this is their theory of causation. In all speculation and in all controversy about causation, the cause is always considered as the parent and the effect as the child, so causes and effects are conceived in terms of generation or of parenthood and offspring. This is a good trope, but it is bad logic. That early civilization which has come down to us through the Greek language inherited this method of looking at cause and effect as if they were different generations of things. Having resolved the multitudinous properties of the world into simple concepts, they speculate as to how one produced the other and disagree about the ultimate parent. Some say number is the father of all things, others that form is the father of all things, others that force is the father of all things, others that being is the father of all things, and, finally, that mind is the father of all things. This controversy has been continued even unto the present time. The speculations on this matter are called metaphysic. In the literature of these speculations we find a large body of valuable material ready for the use of the folklore student.

As tribal man believes that all causation is magic and that causation is also magical generation, he universally believes in

some method of reincarnation. The same bodies appear again and again in different generations. Among the Aryan peoples of India this is systematized into a doctrine of reincarnation by which men are rewarded for the good and evil done in life by being transmuted into other species at death.

Metaphysic is the modern doctrine of metempsychosis; it is a learned explanation of magic; it is sometimes called philosophy, then it is a philosophy of the occult. There are two very distinct schools of metaphysic: the one believes that all material things are creations of the mind, that stars, rocks, and rivers are only thoughts; the other, that all material things are derived from force and that thoughts are only forces. The one believes in the dynamic origin of the universe, the other believes in the psychic origin of the universe. These two primitive doctrines of worlds, which are regions instead of stars, and of the origin of all bodies, properties, and qualities by magical generation, is the cosmology which comes to us from savagery. These doctrines are still believed as vestigial opinions, and we call such vestigial opinions folklore. Cosmology is thus a theory about the regions of the world and how things are created by magic.

Having thus briefly explained primeval cosmology, the primeval ghost theory must be set forth. Tribal man believes in ghosts, and this theory is called animism. The science of ethnology teaches the nature and origin of the ghost theory; that is, it discovers the nature of ghosts and explains how men come to believe in them. There are a good many people who believe in ghosts, the opinion being a survival from primitive society; but with tribal men the belief is universal.

We must first consider what ghosts are supposed to be and what they are supposed to do. I have already explained the primitive world as a domed firmament over a horizontal earth, and that all the bodies seen by men are supposed to inhabit this vaulted tabernacle—to dwell in the tent of the sky. The savage believes also that the stars are living bodies that pass along the

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sky by appointed paths. He sees the heavenly orbs move along the crystalline surface above, every one by a definite way and every one at a definite time. So he sees the heavenly bodies as animals compelled to journey by appointed times and ways in obedience to some spell or magical influence; they cannot move at will, because they are under the power of magic. In the same manner trees and all plants are living beings struck motionless by magic and fixed to the soil. He believes that rocks are living beings rendered motionless by magic. All bodies of water are fixed to the earth in springs and lakes, but free to travel by appointed ways in streams. Every drop of water which is gathered in dew and every drop of rain is a living being under the spell of magic. Every one of the lower animals and every human being may move from place to place at his own will.

With this theory of the nature of the bodies found in the domed world the savage has a further theory that bodies and ghosts have distinct existences. Bodies are composed of solid substance; they can be touched, heard, and seen. On the other hand, ghosts have a tenuous or spectral existence and they are often called specters and sometimes haunts. Bodies do not have life, only ghosts have life. Bodies do not have mind, only ghosts have mind; however, ghosts dwell in bodies, though they may leave them at will. A ghost may choose its own body whenever it finds one unoccupied, and ghosts sometimes quarrel with one another if by chance they wish to inhabit the same body. Ghosts can travel in the world as thought journeys; ghosts can go to the moon and back again in twice the twinkling of an eye. Ghosts are magicians; they can do anything that is wonderful and occult, but they must be freed from their bodies in order to be wonder-makers. A ghost may cause a man to shout, and then instantaneously may go out among the rocks and repeat the call and come back into the man's body, or other ghosts may repeat his words. Such magical wonders the savage sees in every echo. All the

life and mind exhibited by animal and human bodies are attributed to their ghosts, for every body is inert and mindless.

Now we can understand what the jossakeeds are supposed to be. They are persons who can communicate with and have power to control the action of ghosts. It is only in the Algonquian languages that they are called jossakeeds. They are called *adawehe* in the Cherokee. In the hundreds of Amerind tongues there are an equal number of names by which they are known. Scientific men usually call them shamans, but by those who have some acquaintance with the savage tribes of America they are sometimes called medicine-men, and perhaps more often they are called priests. How they come to have these popular names is made plain when we understand the offices which they perform in tribal society. In every tribe in America there are societies called fraternities, as the members of such a society constitute a brotherhood. Among the ancient Greeks and Romans they were called phratries, as we call them fraternities.

Fraternities are organized to control ghosts, the ghosts being considered the active principle in every body. Ghosts control the production of all the fruits of plant bodies, and it is to them that appeal is made for natural fruits; they control the harvests of grass-seeds, nuts, and berries; they control the production of game, and the ghosts of the game birds and beasts are appealed to by these fraternities. In the same manner fraternities are organized to produce abundance of fish. In regions where insects are important portions of the daily food, fraternities are organized to secure their abundance. Grasshopper fraternities are formed in America, grub fraternities in Australia. There is no article of food which may not have its fraternity organized to secure its abundance. Especially in arid lands the relation between rainfall and food leads to the organization of fraternities for the production of rain.

In savage society, disease, even though it may be due to accident, is believed to be the work of ghosts. If a man stumbles he

is supposed to be deceived by a ghost, and if a man is wounded it is the ghost of the tomahawk to which the deed is attributed.

Among many tribes in America a cough is believed to be caused by insects, the toothache by worms, rheumatism by snakes, headache by birds. Every crudely distinguished symptom of disease has a name which is derived from the object whose ghost is supposed to cause the disease; thus there is the bear disease, the elk disease, the rabbit disease. Perhaps it would be a better translation of these terms to speak of them as the bear evil, the elk evil, the rabbit evil, the deer evil, the antelope evil, the turtle evil, the frog evil, the birch evil, the oak evil, the rock evil, the fire evil. Good and evil are clearly differentiated as magical powers, and witchcraft or sorcery is distinguished from shamancraft or jossakeedcraft. Hence fraternities are organized to secure health and to prevent disease and injury.

War-clubs have ghosts. The power of the club is the ghost of the club. Spears have ghosts, and the ghosts of spears have eyes. The warrior who throws a spear must control its ghost. The ghost of the spear must have unerring aim, or the aim of the thrower is in vain. Arrows have ghosts, and arrows will not hit the mark unless their ghosts are controlled. Bows also have ghosts, and bows will fail unless their ghosts are nerved to the task.

It is thus that fraternities are organized to influence the ghosts of food, the ghosts of evil, and the ghosts of weapons.

The jossakeeds are the headmen or chiefs of the fraternities; hence they are sometimes called medicine-men, because sometimes medicine is their office; sometimes it is food, sometimes it is war power, sometimes it is hunting power, sometimes it is fishing power. A shaman is a person who has the power to control ghosts through magic for any or every purpose.

With this understanding of the nature of the fraternity and the chief of the fraternity as a jossakeed or shaman, we are prepared for the explanation of the methods by which the fraternities perform their tasks.

As ghosts are magical beings and perform their wonders by necromancy, so ghosts can be influenced or made to subserve human purposes by magic. Savage man finds his greatest delight in music and dancing. As his own ghost takes supreme pleasure in revelry, so, he reasons, other ghosts love music, dancing, and feasting. Hence festivals are organized by fraternities, and the leaders in these festivals are the shamans. A man is made a shaman because of his supposed skill in organizing the festivals and in conducting their exercises in the manner most pleasing to ghosts. Before the festivals take place, the shamans prepare themselves by various agencies. These methods of preparation are numerous when we consider all the tribes of America, and still more when we consider all the tribes of the world. It will therefore be impossible to set forth all of these preparations; time will not permit; but I will mention some that are common.

It is usual for the shamans to fast during one or more days before the festival takes place, and sometimes the most active participants in the festival take part in the fast. Fasting is almost a universal preparation for a festival among tribal peoples. Puking and purging are also extensively employed. It seems to be universal also that intoxicants are used either by eating or drinking them. This is the primeval habit out of which the modern custom of using intoxicating beverages has sprung. It is a survival of one of the shamanistic rites of savagery which has produced an appetite for intoxicants in the human race. After due preparation by the shaman and other celebrants, the people are assembled in the dance. The shaman usually makes instrumental music, while he may chant some fragments of folklore, parts of which the dancers may repeat in a refrain which is composed largely of unmeaning syllables. Men, women, and children all dance. Hoary-headed grandfathers; old, wrinkled, ugly hags; stalwart and battle-scarred men, earnest matrons, lithe youths, lissome lassies, and prattling children all dance, their naked, swart bodies shuffling and flitting in the torchlight that glints

among the trees and reveals weird shapes in the forest, while over all the stars twinkle and the moon sheds her weird light. The dancing is often interrupted by dramatic performances. The shaman or chief actor relates an appropriate myth, while the members of the fraternity aid him as *dramatis personæ*. Sometimes the performers are masked to represent animals or other mythic personages who are concerned in the myth. Besides masks other heraldic devices are used in ornamentation. The man who represents the bear may have a mask of the skin taken from the head of the bear, or he may be enveloped in a bearskin, or he may decorate his body with paintings to represent the bear or to represent parts of the bear. The man who represents the goose may have the skin of a wild goose stretched over his head, or he may be decorated with the feathers of a goose, or he may have goose emblems painted on his face and body. The man who represents the serpent may have snakes or snakeskins wound about his neck or body, or he may be variously ornamented with symbols of snakes; the actor who represents fire may flourish brands of fire; the actor who represents the sun may have the sun's face painted on his cheeks or his body. Strange and multifarious are the devices used to symbolize the characters which the actors impersonate. So the members of the fraternity are bedecked with masks and skins and feathers and tails and all manner of symbolic paraphernalia.

The leading shaman may intone the myth and himself take part in the acting, while the other members of the fraternity, in panoply of symbolism, perform acts and assume attitudes as they are suggested by the theme of the shaman, though they themselves may speak no words.

The most important ceremonies of every festival are those which have come to be known as altar rites. They are dramatic performances illustrated by altar symbols. The ceremony is a performance founded on some myth about the article of food which they desire or the ghosts which they wish to invoke. The

actors in the drama are the members of the fraternity, and the leading actors are the shamans, while in the dancing, music, and feasting all of the members of the tribe usually take part.

The altar may be a cleared space on the ground, before which the fraternity acts, or it may be elevated upon a table. The objects upon the altar are many, and from tribe to tribe they differ very greatly, though they may briefly be characterized. First upon the altar they place the object desired, the securing of which is the purpose of the fraternity. It may be corn. We know these festivals among the tribes of America as corn dances. They place ears of corn upon the table, and the shaman prays for corn; then they place vases of meal, and the shaman prays that they may have an abundance of meal; then they place sheets of bread upon the table. Among many of the tribes of North America these sheets of bread are as thin as wafers and are folded and piled one upon another. Then they place a casket of jewels on the altar — crystals of quartz, beads of turkis, carnelians, garnets, and other hard fragments of rock; then the shaman prays that the corn may be allowed to ripen and become as hard as the jewels upon the altar. Then they place birds carved of wood or modeled of clay or formed of cotton, all painted to resemble the most remarkable species of the region, and the shaman prays that the harvest may be so abundant that the birds will be made glad. There may be a special fraternity to bring rain; but sometimes the Corn clan will pray for rain, then a ewer or flagon of water will be placed upon the altar, and the shaman, with a brush made of the bright feathers of some bird, will sprinkle the water over the altar and pray that the rain may in like manner descend upon the earth and cause the corn to grow. Then they paint hieroglyphs of clouds upon tablets and stand them upon the altar, and the shaman prays that the clouds may come in due season to bring rain upon the earth.

Festivals are held at certain times of the year and in certain phases of the moon, and especially at certain times indicated by

the signs of the zodiac. Among the higher tribes calendars are kept for this purpose in which the days of the year are counted off by various hieroglyphic devices.

In conjunction with the symbolic numerals indicating the sign of the zodiac or period of the festival, the ceremonies are symbolized in many quaint ways. No field in ethnology is of greater interest than that of the study of ancient calendric symbols. It is these rites of the fraternities for game, harvest, and weather that are regulated by the calendar, because they must be conducted at the proper season.

The medicine rites are not calendric, but the time of their performance is determined mainly by the illness of some individual or by the prevalence of an epidemic. Of course they are not connected with festivals. Notwithstanding this, the shaman must prepare himself with fasting and vigil. Sometimes he resorts to puking and purging; often he takes some narcotic or stimulant which produces stupor, in which the nature and cause of the evil may be revealed. Sometimes he retires to the sweat house, or sudatory, where he is put *en rapport* with ghosts. Sometimes the medicine-man may be initiated by a festival with its ceremonies, the most important element of which consists in a device to produce that ecstasy which is necessary to ghost communication. When the medicine-man appears before the patient —the person possessed of an evil,—he, with the members of his fraternity, may first resort to an intoxicant or narcotic to produce not complete ecstasy but a favorable state of mind. Then he shakes his rattle, and the brethren and sisters dance, while he howls and produces weird ululations in which the fraternity take part at intervals as a refrain. Then he proceeds by various means to extract the evil or devil of which the patient is possessed. The most common practice in America is to extract the evil by sucking it from the body, and especially is it common to draw it out by suction from the top of the head. This may require many efforts and repeated resort to intoxicants with music and dancing.

It may require many days to eradicate the evil in this manner, especially if the patient is an important man in the tribe and the evil is attributed to some ghost controlled by a powerful enemy of the man. In the metaphysic of savagery no man dies a natural death; death is always produced by sorcery or evil magic, for there are bad shamans and good shamans. The good jossakeed finds it hard to contend with the bad jossakeed.

War and the implements of warfare lead to the organization of fraternities which have many rights. These are often festivals. Some are called, by people who witness them among the tribes of America, war dances; others are called scalp dances, because often the scalps of enemies are used as decorative emblems or as altar symbols. In these ceremonies the preparation of the celebrants is of great significance, for they submit themselves to self-inflicted torture, such as swinging on hooks thrust into the body and attached by ropes to a central post around which the members of the fraternity leap and shout and howl. They knock out their teeth, they cut gashes in their bodies, they cut off their fingers or toes, and they do many acts of torture, while with singing and leaping and howling they finally exhaust themselves and produce a state of ecstasy. In this state the ceremonies are believed to be most potent. Then come the dancing, singing, and charming of weapons, all of which is a highly ceremonial affair. This latter part consists of elaborate rites, the purpose of which is to inspire the ghosts of the weapons with anger at the foe.

The symbolism used on the altars at war festivals is very elaborate, for the ghosts of weapons have passions like human beings, and they see and hear like human beings. The weapons themselves are fashioned and decorated with such altar symbols to make them potent. The weapons themselves are potent because of their symbols, and symbolic weapons are constructed to be used on altars and to be used also by shamans who are leaders in the war and in the chase. It is a significant fact of the symbolism pertaining to weapons and implements of the chase, that it is

more highly developed than that of any other department of symbolism found among the Amerinds, as it testifies to the supreme interest which these people take in war and hunting. The symbolism of the weapons of tribal men is already becoming a science.

Thus tribal men believe in ghosts; they believe that ghosts can be controlled, and they organize societies for their control. These societies are called fraternities; they are found not only in America but wherever tribal men are found. We have sufficiently set forth the nature of ghosts as they are conceived to exist in the minds of tribal men, and we have also set forth the method pursued in tribal society to control them. It now remains for us to explain the origin of the notion of ghosts.

Ghosts first come from dreamland, then they come from ecstatic-land, then from hypnotic-land, then from intoxication-land, and finally they come from insanity-land. We cannot enter into the extensive subject of the psychology of the notion of ghosts. I have done that elsewhere. Here I can take only the time to show how ghosts come from dream visions, ecstatic visions, hypnotic visions, drunken visions, and insane visions. Science calls all such visions hallucinations, hence I must show that ghosts are the product of hallucinations.

Dreams we know to be real, for every human being has dreams and every rational human being knows it. At the same time he knows that the notions he entertains in dreams are fallacious. Dreams are realities, for there are such things as dreams; the notions of dreams are not realities, for they are hallucinations. The dream is a reality to which every man of common sense readily assents. The notions of dreams are fallacies to which every man of common sense also assents. Shall we believe in dream notions, or shall we believe in the concepts of waking life?

The notions of dream life are operations of the mind, just as the concepts of waking life are operations of the mind; they are

woven into the structure of the brain in the same manner, and hence they can be remembered in the same manner. Dream action in the mental constitution is less vivid than waking action, and yet there are not many of the thoughts which we produce in waking life that are afterward remembered. Dream thought occurs when the body is at rest, while waking thought occurs when the body is more active; and taking it altogether it is fair to say that waking thought is much more vivid than dream thought. Were this not the case, then we would have the same aptitude to be governed by dream thought as we are by waking thought, but waking life is controlled largely by the concepts developed in waking thought. Dream notions would have little effect on our waking activities were such notions not organized into a system to control waking action. This is accomplished in tribal life by the organization of fraternities; so that there is a special method of perpetuating the notions of dreams. There is abundant literature about dream visions, and the subject is undergoing special investigation by scientific methods.

The dreamer sees strange sights, and strange histories are inacted in his imagination. The dead appear and the living are seen as they appeared in years agone. The personages with which the dreamer was acquainted at different periods of life and at different places widely apart are associated in common transactions. The old soldier dreams of battlefields; not of a specific battlefield on which he fought, but of a battle in which some of the actors are of his immediate acquaintance. His wife is fighting by his side, his daughter is in the ranks of the enemy, or his father is slain. Perhaps feats are performed which in waking hours would cause unbounded astonishment, but which in his dream seem to be natural and commonplace; so dreams are often imaginary histories. As the dream goes on, transformations go on, perhaps by dissolving views. The father becomes a tree, the mother a spring, the daughter a rosebush, and the battlefield a meadow; perhaps the transformation seems not to be a

gradual change. Somehow the new scene replaces the old; but the change causes no astonishment; all seems natural and commonplace.

There is nothing in romance more marvelous than a dream. Listen for a moment to the dreams of *Alice in Wonderland:*

Alice was beginning to get very tired of sitting by her sister on the bank, and of having nothing to do: once or twice she had peeped into the book her sister was reading, but it had no pictures or conversations in it, "and what is the use of a book," thought Alice, "without pictures or conversations?"

So she was considering in her own mind . . . whether the pleasure of making a daisy-chain would be worth the trouble of getting up and picking the daisies, when suddenly a white rabbit with pink eyes ran close by her.

There was nothing so *very* remarkable in that; nor did Alice think it so *very* much out of the way to hear the Rabbit say to itself, "Oh dear! Oh dear! I shall be too late!" . . . ; but when the Rabbit actually *took a watch out of its waistcoat-pocket*, and looked at it, and then hurried on, Alice started to her feet, for it flashed across her mind that she had never before seen a rabbit with either a waistcoat-pocket or a watch to take out of it, and, burning with curiosity, she ran across the field after it, and was just in time to see it pop down a large rabbit-hole under the hedge.

In another moment down went Alice after it, never once considering how in the world she was to get out again.

The rabbit-hole went straight on like a tunnel for some way, and then dipped suddenly down, so suddenly that Alice had not a moment to think about stopping herself before she found herself falling down what seemed to be a very deep well.

Either the well was very deep or she fell very slowly, for she had plenty of time as she went down to look about her, and to wonder what was going to happen next. First, she tried to look down and make out what she was coming to, but it was too dark to see anything: then she looked at the sides of the well, and noticed that they were filled with cupboards and bookshelves: here and there she saw maps and pictures hung upon pegs. She took down a jar from one of the shelves as she passed; it was labelled "ORANGE MARMALADE," but to her great disappointment it was empty: she did not like to drop the jar for fear of killing somebody underneath, so managed to put it into one of the cupboards as she fell past it.

"Well!" thought Alice to herself, "after such a fall as this, I shall think nothing of tumbling down stairs! How brave they 'll all think me at home! Why, I would n't say anything about it, even if I fell off the top of the house!" . . .

Down, down, down. Would the fall *never* come to an end? "I wonder how many miles I 've fallen by this time?" she said aloud. "I must be getting somewhere near the centre of the earth. Let me see: that would be four thousand miles down, I think"— . . . "—yes, that 's about the right distance—but then I wonder what Latitude or Longitude I 've got to?" . . .

Presently she began again. "I wonder if I shall fall right *through* the earth! How funny it 'll seem to come out among the people that walk with their heads downwards! The Antipathies, I think—" . . . "—but I shall have to ask them what the name of the country is, you know. Please, Ma'am, is this New Zealand or Australia?" . . . "And what an ignorant little girl she 'll think me for asking! No it 'll never do to ask: perhaps I shall see it written up somewhere."

Down, down, down. There was nothing else to do, so Alice soon began talking again. "Dinah 'll miss me very much to-night, I should think!" (Dinah was the cat.) "I hope they 'll remember her saucer of milk at tea-time. Dinah, my dear! I wish you were down here with me! There are no mice in the air, I 'm afraid, but you might catch a bat, and that 's very like a mouse, you know. But do cats eat bats, I wonder?" And here Alice began to get rather sleepy and went on saying to herself, in a dreamy sort of way, "Do cats eat bats? Do cats eat bats?" and sometimes, "Do bats eat cats?" for, you see, as she could n't answer either question, it did n't much matter which way she put it. She felt that she was dozing off, and had just begun to dream that she was walking hand in hand with Dinah, and was saying to her very earnestly, "Now, Dinah, tell me the truth: did you ever eat a bat?" when suddenly, thump! thump! down she came upon a heap of sticks and dry leaves, and the fall was over.

Alice was not a bit hurt, and she jumped up on to her feet in a moment: she looked up, but it was all dark overhead; before her was another long passage, and the White Rabbit was still in sight, hurrying down it. There was not a moment to be lost: away went Alice like the wind, and was just in time to hear it say, as it turned a corner, "Oh my ears and whiskers, how late it 's getting!" She was close behind it when she turned the corner, but the Rabbit was no longer to be seen: she found herself in a long, low hall, which was lit up by a row of lamps hanging from the roof. There were doors all round the hall, but they

were all locked, and when Alice had been all the way down one side and up the other, trying every door, she walked sadly down the middle, wondering how she was ever to get out again.

Suddenly she came upon a little three-legged table, all made of solid glass; there was nothing on it but a tiny golden key, and Alice's first idea was that this might belong to one of the doors of the hall; but alas! either the locks were too large, or the key was too small, but at any rate it would not open any of them. However, on the second time round, she came upon a low curtain she had not noticed before, and behind it was a little door about fifteen inches high; she tried the little golden key in the lock and to her great delight it fitted!

Alice opened the door and found that it led into a small passage not much larger that a rat-hole; she knelt down and looked along the passage into the loveliest garden you ever saw. How she longed to get out of that dark hall, and wander about among those beds of bright flowers and those cool fountains, but she could not even get her head through the doorway; "and even if my head would go through," thought poor Alice, "it would be of very little use without my shoulders. Oh, how I wish I could shut up like a telescope! I think I could, if I only knew how to begin." For, you see, so many out-of-the-way things had happened lately that Alice had begun to think that very few things indeed were really impossible.

If we consider dreams to be omens and recall them to divine the future, this constant familiarity with them makes the absurd itself seem real. Then if we practice the methods of hallucination, visions become realities. Poets, philosophers, statesmen, warriors, and religious zealots are peculiarly liable to such visions, and to them visions are realities. One of the most common methods of producing visions is by crystal-gazing. When rational judgment is overturned and false judgments are made, the realm of ecstasy, like the realm of dreams, is a home of hallucinations. In civilization crystal-gazing is an art of mountebanks, but in the earlier stages of civilization men resorted habitually to the practice of ecstasy by a great variety of methods.

So hypnotism is a source of hallucination. In civilization it may be practiced as a curative agency, but mountebanks sometimes practice it for purposes of deception. In tribal society

hypnotism is a customary agency to secure communication with ghosts. In civilization intoxication has become a remedial agent and is universally practiced to relieve pain and to produce unconsciousness during surgical operations; but intoxicants and narcotics are used in savagery as an agency by which men may communicate with ghosts. Oftentimes disease subverts the intellectual faculties and men become insane, and they are treated for insanity as for other diseases; but in tribal society the insane are supposed to be possessed of foreign ghosts—that is, ghosts not proper to their bodies. So the realm of ghosts is the land of dreams, the land of ecstasy, the land of hypnotism, the land of intoxication, and the land of insanity. Ghost notions are produced by visions. To confound the notions of visions with the concepts of waking reality is to pass into the land of mystery—the uncanny realm.

It is thus that the study of folklore has come to be the most practical and valuable of all the sciences, for it reveals the origin and nature of superstitions and makes the grand scientific distinction between valid concepts and uncanny visions.

The habit of believing in the impossible, of expecting the absurd, and of attributing phenomena to the occult, gives rise to two classes of magical agencies which, from savagery to the highest stages of culture, have played important roles in the explanation of magic. These are the beliefs in mascots and taboos.

Those who dwell on the mysteries of life, especially as they are revealed in ecstasy, hypnotism, intoxication, and insanity, are forever looking for mascots or mysterious causes. Such occult agencies are sweet morsels to superstitious people, just as scientific men delight in the discovery of scientific facts. What a wonder it was to scientific men to discover that bones could be photographed through their covering of flesh! The discovery of the Rœntgen rays was held to be so important that the discoverer was awarded a great meed of praise. But the potency of the left hind foot of a graveyard rabbit plucked in the dark of the moon

is held by superstitious people to be of more importance than the Rœntgen rays. More people believe in mascots than believe in telephones, and those who believe in mascots believe that telephones are magical. In the same manner taboos perform wonderful magic feats in the notions of many persons. In savagery there are many taboos, and men must not do this thing nor that thing lest their enterprise should fail. Survival of taboos still exists; e.g., thirteen persons must not sit at the table lest one should die. So mascots and taboos still have their influence in civilized society.

I have already explained the origin of the seven regions or worlds existing in the notions of savagery, and how four of these, the cardinal regions, were transmuted into the cardinal substances — earth, air, fire, and water. I have also explained that still three of the regional worlds remain in folklore — earth, hell, and heaven. Then I have explained the nature of ghosts and how the notion of ghosts springs from dream visions, ecstatic visions, hypnotic visions, drunken visions, and insane visions, and have still further explained how magical causation still lives in folklore by pointing out the influence which mascots and taboos exert in society.

I have yet to point out one more source of folklore to which allusion has already been made. The habit of explaining mysterious phenomena from visions has developed a special learning or cult which is known as metaphysic. This I must now set forth. In so doing I shall show that the belief in magic still exists in very highly cultured quarters. Metaphysic is a system of explaining how the properties of bodies are generated one from another. In modern times there has come to be two very distinct schools of metaphysic — the one called idealism and the other materialism. The idealists believe that the properties of bodies are all generated from mind; the materialists believe that the properties of bodies are all generated from force.

A third school remain who believe that the psychic properties

of bodies and the physical properties of bodies are derived from distinct substances: the physical properties of bodies are derived from a substance that can be tasted, touched, felt, heard, and seen, while the psychical properties of bodies are derived from a tenuous or spectral substance which can be manifested to the senses of certain persons only under certain conditions. This third doctrine is the survival in modern times of the ancient doctrine of animism. It is only with idealism and materialism that we are here to deal.

On my table there lies a knife made by one of the ancient inhabitants of America from a bowlder of clay sandstone. I can break it into pieces, that is, dissect it into parts, and put these parts in different bottles, or I can analyze it into different substances and put these substances into different bottles. For simplicity's sake let us say that it is composed of oxygen, silicon, aluminum, hydrogen, and iron. By analysis I can separate these substances and put each one in a different bottle. This same aboriginal knife has properties; but I cannot separate them from the knife and put them into distinct bottles. I cannot dissect them into properties, nor can I analyze them into properties, and yet the properties are realities. While they are not discerpible, they are still concomitant and may be considered severally, although they cannot exist severally. Bodies can be generated one from another, animals may be generated from other animals, plants may be generated from other plants, rocks may be generated from other rocks; but essential properties cannot be generated from other properties, affinity cannot be generated from persistence or causation, persistence cannot be generated from force, force cannot be generated from form, form cannot be generated from number. Properties cannot exist apart; although they are concomitant they can be considered severally. Ladd[1] says, "All the essential factors which belong to the conception of

[1] *A Theory of Reality*, New York, 1899.

a thing are harmoniously present to our cognitive experience in every concrete thing." In this he affirms that the essential properties of things are concomitant, and that one cannot exist without the other; and he goes on in many chapters of his new book to prove this concomitancy of properties and the impossibility of their dissolution. Some of the Greeks thought the property, which is the father or ancient (ἀρχὴ) of all others, to be number. This is the doctrine ascribed to Pythagoras. Plato thought the father or ancient of all properties to be form. Aristotle thought the ancient of all properties to be energy or force; others of the Greeks thought the ancient of all properties to be being. In modern times two schools have been developed—one which claims that the ancient of all properties is mind, the other that the ancient of all properties is force. Thus we have idealism and materialism, which are theories not of the origin of bodies by genesis one from another, but of the origin of properties by genesis one from another.

In the earlier controversies on this subject—and they have been many and bitter, for the opinions held about them are supposed to come from those regions which we call hell and heaven,—a peculiar theory of properties is taught. All bodies are supposed to be porous and to be composed of unknown and unknowable matter, and the properties are supposed to be held in their pores. This doctrine took on the most extreme notions about the nature of magic. The matter or substance of a body could give out an inexhaustible supply of these properties, or they could absorb an inexhaustible supply. Substance, or substrate, according to this theory, is endowed with magic as the inexhaustible cause of properties. The flint knife has number; it is many in one, but you cannot gather the knife into one bottle and the number into another. The same piece of quartzite has form, which is its structure and shape, but you cannot take its form and put it into a distinct bottle. The same fragment of rock has motion—the motion of the earth about its axis, the motion of the

earth about the sun, and that motion which we call heat,—but you cannot take this motion called force and put it in a distinct bottle. This same bit of rock has persistence, or being, or causation, but you cannot take this being away from the flint knife and put it by itself in a distinct bottle. The same bit of quartzite is composed of different chemical substances that have affinity one for another, but you cannot take this affinity away from the molecules of the knife and put it in a bottle by itself. Here we have five properties of things,—number, form, force, persistence, and affinity,—but they are inseparable. A survival of this doctrine existed in science up to the days of Newton, for he believed that heat, which is a mode of motion or force, could be indefinitely added to or taken out of a body. The greatest work of the greatest philosopher of time was marred by this superstition—a survival from an earlier day. His successors in scientific research have repudiated the doctrine. The same superstition that properties may be produced one from another in inexhaustible generations still exists, and the lore of these superstitions is called metaphysic; but there are two schools of metaphysic,—one believing that all other properties are generated by the psychic property, the other believing that all other properties are generated by the force property.

At one time in my life I believed in idealism, and for forty years I have been a constant reader of its literature. During all this time I have never ceased to search for a definition of idealism. I have forever been on the lookout for the standard concept of the theory, and from time to time I have tried to grasp the concept and express it in language. During the present year a great scholar has devoted two large volumes to the defense of idealism, and I find that there is involved in his new book a definition of idealism which is as good as any other that I have read, though it is not expressed in affirmative and concrete terms so that they can be quoted. I must therefore attempt this definition, premising that I obtain it from what

seems to be implied by James Ward in his voluminous exposition of the subject.[1]

Idealism is a theory that all of the material objects of the universe, other than human beings, are created or generated by mind, and that human beings are the real things and all other things are but the concepts of human beings. There are no stars, but only human concepts of stars; there are no waters, but only human concepts of waters; there are no rocks, but only human concepts of rocks; there are no plants, but only human concepts of plants; there are no lower animals, but only human concepts of lower animals. However, on this point Ward is vague. Either he has not considered the subject, or has not committed himself to a doctrine of the reality of the lower animals. God and human beings are realities which manifest themselves to one another in perception and conception as ideas of the objective world.

He rejects the scientific use of the term phenomenon as a manifestation of objective reality, and adopts the use of the term as a manifestation of mind. He teaches that science is a method of expressing ideas; it is but a system of language and has no other significance than that of a system of language. There is no objective concrete world with which science deals; but there are ideas with which science deals, and the whole function of science is to reduce these ideas to their simplest expression. There is no objective standard of truth; there is only a subjective standard of opinion, and all scientific research is the attempt to formulate these opinions or ideas or concepts or perceptions in universal terms.

Science is only a device of language; mathematics is only a device of equations; chemistry is only a device of atoms; astronomy is only a device of worlds; geology is only a device of formations; botany is only a device of cells; biology is only a

[1] *Naturalism and Agnosticism*, New York, 1899.

device of organs. All of these devices are useful for linguistic purposes; they do not express objective reality, but only subjective ideas. The world is a realm of ideas and words. It is not a realm of objective real things. This is how I interpret idealism as expounded by James Ward and by all other idealists.

On the other hand materialism is a theory of the existence of the world as constituted of forces. This theory is perhaps best expounded by Boscovich as points of motion, not points in motion; — centers of motion, not centers in motion. There are no atoms or molecules in motion, but there are atoms or molecules of motion. There are no stars in motion, but there are stars of motion. There are no waters or gases in motion, but there are gases of motion. There are no rocks in motion, but there are rocks of motion. There are no plants in motion, but there are plants of motion. There are no animals in motion, but there are animals of motion. There are no thoughts that are the motions of brain particles, as there are no brain particles, for thoughts are motions themselves.

Usually it suits the logic of idealism to speak of forces as usually it suits the logic of materialism to speak of motions.

Idealism accuses all scientific men of being materialists, and it divides mankind into two groups, the good and the evil. The good are idealists and the evil are materialists. The idealists are from heaven and the materialists are from hell. Idealism accuses materialism of ignoring all values in the world; it forever seeks to belittle scientific research. Chemistry is only a controversy about words; astronomy is only a disputation about words; physics is only a disputation about words; geology is only a disputation about words; botany is only a disputation about words; and zoölogy is only a disputation about words.

Materialism accuses idealism, as being the enemy of science, of rejecting every scientific discovery until it can be translated into terms of idealism, being the great bulwark of ignorance and the fortress of superstition.

As idealism is interpreted by materialism the accusations are true, and as materialism is interpreted by idealism the accusations are true. Materialism is arrayed against religion, and idealism is arrayed against science.

Both idealism and materialism are fallacious because they both attempt to reduce all of the properties of bodies to one, and in so doing they transmute the realities of the world into magic and continue the superstitions of primeval culture. What these superstitions are we have attempted to set forth. The particular logic which is used by both parties is called dialectic. This logic consists in the use of words with more than one meaning, — the habit is universal as trope and upon it the beauty of literature largely depends. The origin of trope is found in the concomitancy of properties. The essentials of all properties are concomitant in every particle of the universe; so that when one property is discovered, then others may be assumed — the discovery of one implicates the existence of all. If we discover the property of number in a body, it implicates that there exists the property of form. If we discover the property of form, it implicates the property of force. If we discover the property of force, it implicates the property of causation. If we discover the property of causation, it implicates the property of affinity. One of these properties cannot exist without them all. This implication is a fundamental habit in psychology. When I taste an apple, I implicate its touch property, that is, its form. When I touch the apple, I implicate its force property, that it has weight, or that it has that motion which we call temperature, or that it has that motion which is common to all the objects of the earth. When I weigh the object in my hand by the sense of strain and discover the force property, I implicate the further property of causation, that it has the property of cause and effect; and when by my sense of causation I discover cause and effect in the object, I implicate that it is composed of particles held together by affinity.

Thus, when we cognize one property in a body, we recognize its other properties with which we are familiar, and this engenders the habit of figurate expression. The majority of words are used with figurate meanings; but we must not carry such meanings into logic; we must use terms with single meanings. This is the fundamental necessity of science. The fallacy of using words with different meanings in the same proposition of logic was pointed out long ago even by the Greeks and has been constantly referred to in modern systems of logic, and yet this is the primal fallacy of dialectic, or that method of reasoning which is used in metaphysic. It is the failure to distinguish figurate from fundamental meanings that constitutes the logical source of all the fallacies of metaphysic. I speak of a parallelogram of forces as if force itself were a property of form. This figure of speech is of daily use in the mathematical classroom, and it serves a good purpose in presenting the concepts of force by a diagrammatic method; but just as soon as you forget that it is a method of figurate expression, and apply it to the equations regularly developed in the higher mathematics, and talk of n dimensions of space instead of n dimensions of motion, you are in the realm of absurdity. N dimensions may be used in equations, but there is no such thing as n dimensions of space.

In dialectic logic there is no term which is so tortured with diverse meanings as *form*. Form fundamentally means space relations fixed by structure and externally exhibited as figure, but any body which has form must have all other of the properties, and so we use the term form with a figurate meaning to apply to any one of the properties of a body. This is good trope in poetry; it is good trope in literature; but it is fallacious in logical reasoning.

There are two elements of motion, the one absolute and the other relative. Speed is the absolute, path is the relative. Speed is the rate of motion; sometimes velocity is used as a synonym. Speed cannot be defined in terms of space and time, but speed

can be measured in terms of space and time. You cannot reduce speed to space and time, but you can measure speed in terms of space and time. Measurement is not reduction. Measurement is the expression of one thing in terms of another. We may use reduction by metonymy for measurement. We may reduce feet to miles or we may reduce cents to dollars; that is, we may express feet in terms of miles or we may express cents in terms of dollars. We can reduce one quantity to terms of another by standard tables or by actual measurement, but we cannot change one quantity into another. So we cannot change speed into space and time, though we can express the rate of speed in terms of space and time. There is no possibility of transmuting speed into space and time, one or both, though by a habit of expression we may speak of reducing speed to space and time. Yet every man must understand that he is using the term *reduce* only as a trope. How often I have listened to the statement that motion can be reduced to space and time—by motion the speaker meaning speed, and by reduction the speaker meaning the annihilation of motion.

When we use the term *form* or the term *reduce*, now in one sense and now in another, it confirms the belief in magic that one thing can be transmuted into another by occult causation. It makes the world a playhouse of legerdemain, and this is just the mental attitude necessary to conviction when metaphysical propositions are the subjects of discussion. By metaphysical propositions I mean those propositions by which the idealist attempts to prove that all the properties of bodies are fundamentally ideal, or when the materialists attempt to prove that all the properties of bodies are fundamentally dynamic.

I use metaphysic as the term to indicate that doctrine which affirms that one essential property can be derived from another, whether it be idealism or materialism, and I use the term to distinguish it from such doctrines as are taught by science.

That bodies and their properties can be produced by magic is

one of the oldest errors in human reasoning. This primeval error still remains as the essence of modern metaphysic in the doctrine that one essential property can be produced from another or be transmuted into another.

I have used the terms idealism and materialism because these are the terms by which these theories are usually known, but I think that the real nature of materialism would be better expressed by calling it dynamism, for that which I have called materialism is a theory that all the properties of bodies may ultimately be reduced to motion or force, and it would be peculiarly apt to call the doctrine dynamism.

There is a variety of this doctrine of dynamism which cognizes that there are other properties which cannot be reduced to force, such as mass or number, and extension or form, and time or cause, and yet it is believed that mind or consciousness can be reduced to force or motion. In this condition it becomes a dynamic theory of mind, but idealism derives all of the properties from consciousness or mind.

All human language is symbolic, for a word is the sign of a concept. The spoken word *horse* is the symbol of the concept of a horse. The written word *horse* is the symbol of the spoken word *horse*. The written word is therefore the symbol of a symbol. The written word and the spoken word are alike signs, and as linguistic phenomena they are signs of concepts; but the signs of the concepts are also signs or symbols of the objective reality which they signify. Being symbols of concepts they are also symbols of objective realities. There is a concept of a horse and there is also the horse itself. The horse is an objective reality, the concept is a subjective reality, and the same symbol stands for both. The word *dream* stands for an objective reality as an act of the dreamer; it also stands for a subjective reality when it stands for the act of the ego who is the dreamer. What is objective may also be subjective, for the object and subject may be the same person. Unless we understand this we cannot

understand psychology at all. It is fundamental to scientific psychology that the distinction between subject and object vanishes when the ego is the object, for the ego is also the subject. A word is a sign of a concept, or, as some grammarians tell us, it is the sign of an idea; but it is also the sign of the object. The history of spoken words seems to teach that the concept is rather held in view; the history of written words seems to teach that the objective reality is held in view; but in both cases the concept and object must be firmly grasped if we are to have a sound psychology. Thus the distinction between concept and object vanishes in symbolism, and the distinction between subject and object vanishes when the object is also the subject.

Idealism is a theory that there is no objective reality, or, to use the language of modern idealism, there is no trans-subjective reality. Symbols are signs of ideas, but not signs of objects. The objective world thus becomes the creation of thought. The apparent or phenomenal objective world is created magically by thought. There are no stars as objective realities; there are only stars by the magic of thought. Astronomy is not a science of orbs which depends upon the existence of objective realities; but it is a science of words which depends upon our concepts, and contributions to astronomy are only contributions to language and consist only in a better method of using symbols as words to describe our concepts. There are no atoms or molecules or substances as science teaches; but there are concepts of atoms, molecules, and substances, and all contributions to chemistry are but contributions to language by which symbols that do not represent reality, but only concepts, are made more useful as linguistic devices. There is no such a thing as motion; motion is but the product of thought. We think there is motion, but it has no objective reality, and contributions to dynamics are only contributions to language.

James Ward does not always assert these doctrines, but when he does not assert them he assumes them. When he antagonizes

materialism and substantiates his claim by quoting Boscovich and Huxley and other champions of materialism, he makes such assertions. He is right about the metaphysic of materialism, but he does not see that he overthrows metaphysical idealism by the same argument.

When the subject becomes the object, that is, when the thinker thinks about himself, the distinction between subject and object vanishes. The same principle holds true when we attempt to distinguish between mechanism and telism in the universe. Changes of dissolution are mechanical; changes of evolution are both mechanical and telic. There can be dissolution without telism, but there cannot be evolution without a mechanism which is telic. The watch in my pocket runs down by mechanism; it is wound up also by mechanism, but the winding of the watch involves telism. I cannot telically wind my watch; that is, I cannot wind it with my purpose unless at the same time I resort to the mechanism provided for winding the watch. All organic changes are controlled by purposes, but inorganic changes may occur without a purpose purely through the agency of mechanical laws. It is the error of materialism to suppose that all classes of changes are mechanical, that all telic changes can be resolved ultimately into mechanical changes, for in fact every telic change requires a mechanism, but the mechanism does not work without the purpose. The distinction between purpose and causation vanishes when purpose becomes a cause.

ABORIGINAL QUARRIES AND SHOPS AT MILL CREEK, ILLINOIS[1]

By W. A. PHILLIPS

The quarries and shops about the village of Mill Creek, in southern Illinois, have been known for many years, but up to the present time have received only passing notice. The remains, however, indicate an important source of the large flaked implements of Mississippi valley, while the material quarried is one widely distributed in finished products. Identified with a region of unusual interest, the locality ranks with other centers of aboriginal flaking which have been recently studied.

Previous work relating to the subject is apparently covered in the following references. In Prof. Cyrus Thomas' description[2] of remains in Union and Alexander counties an account is given of the appearance of the main group of quarry pits west of the village and mention made of the prevalence of flaking refuse on many sites in the vicinity, notably on the Hale farm. In Professor Thomas' catalogue reference may also be found.[3] Another description of the mounds, by Mr G. W. Morse, was published in volume III of the *American Antiquarian.*

In 1886 Mr Gerard Fowke visited the locality and inspected the quarries, and subsequently described many of the products of the shops. In his classification of the types of spades this author cites numerous examples from Union county and refers to series of unfinished forms obtained at Mill Creek.[4] From Mr Fowke and

[1] Read before Section H, American Association for the Advancement of Science, Columbus meeting, August, 1899.

[2] *Report of Mound Explorations of the Bureau of Ethnology;* Twelfth Annual Report, pp. 148, 154.

[3] *Catalogue of Prehistoric Works East of the Rocky Mountains*, p. 68.

[4] *Stone Art;* Thirteenth Annual Report Bureau of Ethnology, pp. 79, 133–138; figs 59, 169, 170.

from residents of the village I have learned that observations were also made at this place by Col. P. W. Norris in 1884 and later by Messrs R. E. Earll and L. H. Thing.

A number of Mill Creek rejects collected some years ago by Mr R. L. Fahs and now in the museum of Northwestern University, led to the present study, which was begun in December, 1898, and continued in April, 1899, under the direction of the Field Columbian Museum. The writer is especially indebted to Dr G. A. Dorsey, curator of anthropology in the last named institution, for valuable suggestions and personal assistance in the exploration. As the work is not yet finished, only a preliminary report can be offered.

Material and Distribution. — I cannot perhaps do better than to point out in the beginning the distribution of products in this stone. In collections which represent the general area—southwestern Illinois and eastern Missouri—several varieties of chert or flint reappear constantly as materials used for flaking, and of these certain distinguishing shades of color have thus far formed the basis of descriptions. They are spoken of as cream-white, whitish or light gray, yellow, brown and grayish-brown flint and chert, nodular bluish-gray hornstone, etc. The large forms classed as agricultural implements commonly occur in the darker varieties of rather coarse structure, although materials of finer grain corresponding to the lighter colors were shaped into smaller examples of the same class.

The chert obtained from the Mill Creek quarries was the least handsome of the flinty stones used for flaking. While generally of grayish-brown, an examination of the refuse heaps shows a number of colors. Sometimes the material is yellow or again brown, red-brown, mottled pink and gray, or gray, but all are of the same dirty or dusty cast. A banded arrangement of colors is also noticeable. In structure much of the material is coarse, fairly smooth on fracture, and with little or no luster. It is also soft in comparison with other flints and not remarkably brittle,

yet in one particular it surpassed all other stones and that was in its adaptability for flaking into broad, thin blades. More exact characters upon which to establish the identity of the chert derived from the Mill Creek diggings with that distributed over the region in finished tools will probably develop from microscopic sections now being prepared. Along both banks of the Mississippi to a point considerably north of St Louis, and in the opposite direction through the southeastern counties of Missouri, blades of this stone are common. As the limestone formation in which the chert occurs is of great extent, other sources probably exist.

Locality.—The village of Mill Creek, Union county, is situated on the Mobile and Ohio railroad, half a mile north of the south line of the county. The stream of the same name which passes out of Union county at this point, becomes the dividing line between Alexander and Pulaski counties next adjoining. The locality, therefore, includes small portions of three counties. The surface is hilly and wooded. In the sketch map (figure 1) the sites of quarries and shops are indicated. The main group of pits is one mile west of the village on portions of Sec. 31, T. 13 S., R. 1 W., and Sec. 36, T. 13 S., R. 2 W. There is a smaller group two miles north of the village on Sec. 19, T. 13 S., R. 1 W., near the middle of the section. Shops are scattered about the hills both near to and at a distance from the quarries. The large shop site in Sec. 6, T. 14 S., R. 1 W. (Alexander county), offers the greatest visible accumulation of refuse. A railroad cut at Weaver hill, about three miles north of the village, and several mounds, are also shown on the map.

Geology. — Extensive phenomena of rock disintegration are met with in this part of the state which lies south of the glacial boundary, and it is with one of these that we have to deal in examining the source of the chert. The railroad cut at Weaver hill furnishes an excellent view of the chert-bearing formation, and a study of the soil and rock exposed at this point was of

great service in trenching the quarries. The section is through clay overlying the limestone. In the sides of the cut and in the embankment beyond the hill, nodular masses of chert are scattered in great numbers. Details and measurements taken at the

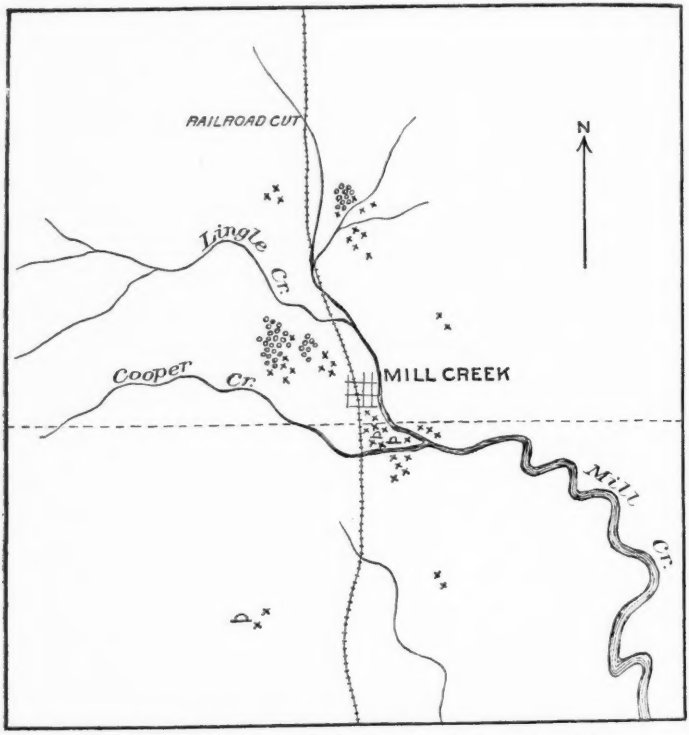

FIG. 1—Map of the vicinity of Mill Creek, showing location of quarries and shops.

middle of the cut were as follows: Fifteen feet of reddish clay constitute the upper stratum, which is free from gravel and other stones with the rare exception of a pebble here and there near the bottom of the layer. A broken pavement-like layer of cherty rock, eight inches thick, lies next below, but is poorly defined. Twelve feet of clay of a deeper red, mixed with coarse sand and many free nodules of chert, complete the section down

to the limestone. There is no arrangement of the nodules as they lie in the clay. The limestone may be seen to a depth of nine feet and presents an uneven surface. Cavernous hollows and furrows six to eight feet deep, and of irregular width, separated by rounded and often fantastic prominences of rock, characterize the exposure throughout its length, a distance of several hundred yards. The original condition and manner of occurrence of the chert are at once apparent. Thin horizontal rows of concretions, often regularly spaced and mainly of one size in a given layer, stand out of the softer rock in a conspicuous manner. Many empty socket-like cavities show where nodules have dropped from their places, while loose nodules may be rattled about in other cavities which have not dissolved to such an extent as to free the stone. A much greater thickness of limestone than the twelve feet now represented in mixed clay, sand, and chert next above must have existed to supply the number of concretions that are found free.

The conditions here presented probably do not occur within the glacial boundary, except in the driftless area, which Mr Leverett informs me offers similar phenomena in northern Illinois.

There are few nodules to be seen on the surface or in natural exposures in the surrounding country, still they were observed in stream beds at two points on branches of Mill creek south of Weaver hill, and a large block of limestone with a row of protruding nodules occurs several miles west of the village on a branch of Lingle creek. A knowledge of the underlying stratum containing free chert concretions might formerly have been gained from such occurrences.

Characters of the Chert Nodules.— Externally the nodules are all of a rusty brown color, rough and harsh and slightly encrusted. In shape they are usually thin and flat with curved outlines and rounded edges, but as with many other nodular formations the shapes and sizes are exceedingly varied. The cross-section is

generally in the form of an elongated ellipse (figure 2, *b*), which greatly facilitated the flaking of large products. Some masses are like flagstones, occasionally two feet long and half as wide, and vary from two to five inches in thickness. Small nodules are like flat-pebbles and cobblestones. Several smaller masses are often united by arms or extensions, with openings between, while the shapes of familiar objects, the heads of animals, etc., are imitated.

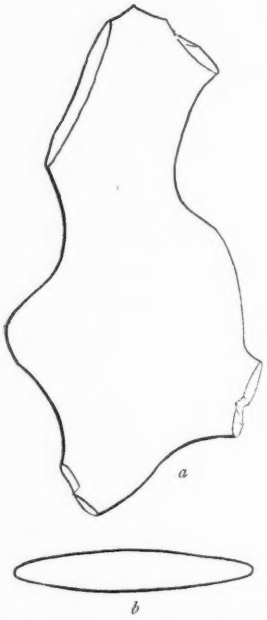

FIG. 2—Outline of large chert nodule and characteristic cross-section. (One-sixth natural size.)

The Quarry Sites. — The main site of ancient quarrying is reached by a path along the top of the hill which rises directly west of Mill Creek station. The distance is little less than a mile to the first of the pits, a group covering four or five acres, while across a narrow valley and on the next hill to the west, the pits cover an area of ten or twelve acres. The land is wooded, but many of the larger trees have been felled and a considerable growth of small trees and bushes obstructs a general view. Bowl-shaped depressions, twelve to forty feet in diameter, are closely crowded together over the top and down both sides of the hill. Few exceed four feet in depth, but accumulations of leaves hide the surface. While the exploration was in progress, a fire which burned over the area of the smaller group did much to reveal surface appearances. Although scattered refuse is fairly abundant, it is in great measure imbedded in the soil. Along the west slope, at the head of a steep side-valley in the hill, the pits are elongated into indistinct trenches.

In regard to the number of pits on this hill, a definite result was never obtained in spite of many attempts to count them during the early part of the investigation, but it is safe to say that there are several hundred. Any count, however, would be inexact if surface indications only are considered, as facts learned from the excavation will show.

The pits located on Sec. 19, north of the village, occupy a low hill in the corner of a field which has long been cultivated, and in extent cover about three acres. This is probably the place to which reference is made by Professor Thomas [1] as difficult to plow on account of stone refuse. A section of the hill seems formerly to have been exposed by the stream which flowed through an old lagoon on the southeast, and in disclosing the presence of the nodules may have led to the ancient quarrying. The remains of about forty pits were counted, although cultivation has nearly

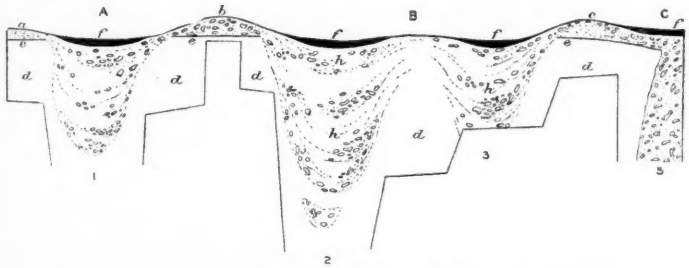

FIG. 3—Diagram of trench in western wall of quarry site. A, B, C, average depressions in the surface of quarry site; *a*, *b*, *c*, dump piles; *d*, undisturbed red clay; *e*, former surface; *f*, mold; 1, 2, 3, ancient pits filled by natural agencies; 5, position of a pit filled at the time of active quarrying; *h*, *h*, *h*, quarry tools. Length of section, 62 feet; greatest depth, 24 feet. The angular outline represents the floor of the trench seen in profile.

leveled the surface. Near the fences just above the stream bank the pits are well defined.

Excavation on the Main Quarry Site. — A trench shown in figure 3 was dug along the top of the hill near the northern end of the large group of pits. Two well-marked depressions (*A* and *B* in the diagram), were selected for the purpose, one nineteen feet, the other thirty-two feet in diameter, separated by a bank about

[1] *Mound Explorations*, op. cit., p. 155.

three feet high (*b*). Digging was begun on each side of the bank, and the undisturbed clay and former surface of the hill determined at that point. Above the old soil the pile consisted of a mixture of broken nodules, coarse sand and clay, and occasional flakes and rejects.

Extending the section across both depressions, a deposit of black forest mold was first encountered, covering the surface of each pit to a depth of eight or ten inches at the thickest portion. Below the black mold, material like that found in the bank but showing partial sorting and arrangement in bowl-shape layers, was followed to a considerable depth. The old pit (marked 1) was traced to a depth of over ten feet, with a width of ten feet at the mouth between undisturbed soil. Pit 2 was followed to a depth of eighteen and one-half feet, with a width at the top of thirteen feet. As the work progressed it became evident that two old pits occupied the space of the single large depression (*B*). The second of these (3) was not traced below seven feet; its width at the mouth was approximately twelve feet. The mixed material which filled the openings was of yellowish color, and soft and wet in comparison with the stratum of firm red clay which surrounded it; there was therefore very little difficulty in tracing the outlines in the wall of the excavation. The openings were funnel shaped, and judging from the partial arrangement of the filling, had acquired their form from natural causes — the gradual washing in of the surrounding dump-piles and the caving of the edges.

In tracing the old pits, the dump-piles, *a* and *c*, seen at the right and left in the figure, were intersected by the trench. These piles differed from the one first excavated, in that *a* was wholly clay, and *c* clay topped with a layer of broken nodules. Save for the dump-piles and mixed contents of the pits, the section was altogether in the overlying red clay represented at the railroad cut by a thickness of fifteen feet and here by several additional feet. Stone had not been encountered at any point in undisturbed relations. An attempt was then made to reach the

nodule-bearing stratum, and the depth at the lowest level in the trench, under pit 2, was increased to twenty-four feet, when stone was encountered. The wet contents of the old pit, however, made further work dangerous, and a cave-in followed soon after the bottom was abandoned.

Trenching was then continued through the next depression (*C*), shown at the right, when the outlines of two more openings appeared, one in either wall of the trench. Pit 4 presented the characters of the three already described; pit 5 was quite different. While the mouths of the pits previously examined had evidently been left open when deserted by the quarrymen, the last pit exposed had been filled when still fresh with material brought from the bottom of some neighboring pit, and had therefore been preserved in its original shape. This pit was traced to a depth of ten and one-half feet and was found to slant into the trench in a manner favorable for excavating. Its contents were like the material found in bank *b*,—mainly broken nodules without arrangement or sorting. Operations were here brought to an end, but measures were taken to protect the work done on this portion of the trench that it might be resumed at the stage in which it was left. The trench reached a length of sixty-two feet.

The distribution of art remains need only be pointed out in this connection. Hammers of peculiar type were found in pits 2 and 3 at the places indicated by *h*, *h*. Flakes were fairly well represented in some layers of the filling, and were encountered as far as the pits were traced. Few rejects of stages of working above that of testing were found in the excavation. A broken flaked stone, classed as a reject at the time of finding, has since with washing proved to be a used implement — a digging tool in all probability. Nodules bearing the marks of a few blows, as evidenced by the loss of a single flake or the presence of a fracture, constituted the main proof everywhere of previous handling and testing of the stone.

The character of the section shows that no change is now

going on, and present conditions have probably existed during the whole period of growth of the trees standing on the site. Few trees grow in the depressions; the largest oaks, some of a diameter of two feet, are rooted in the old dump-piles above the former surface.

The Quarry Refuse. — In digging through the clay, the ancient quarrymen brought to the surface so much of that material that its mixture with the stone refuse was constantly resulting, and this fact in some measure accounts for the scarcity of visible quarry-shop litter; still, in some spots, especially on the western slope of the hill, low piles were observed which were examined for the purpose of determining the character of the work done after the nodules were brought to the surface. Over circular spaces averaging fifteen feet across, broken nodules were scattered as if a selection of desirable stone had been made. The work was confined mainly to trimming off bunches and irregular ends and testing the quality of the stone by such fractures and occasional flaking. Some rejects occur of stages of working far advanced toward finished forms, but they are relatively few. Shaping seems commonly to have been carried on farther from the site of quarrying. Small shops occur on the cleared land at the southern end of the hill, and others near by may be obscured by the forest.

Quarry Tools. — The tools recovered from the trench were probably all used in the quarry work proper. The used and broken blade shown in figure 4, *a*, was a thick, roughly shaped implement of a type similar to the agricultural tools of the region. While not complete, its shape is readily supplied from other examples obtained from the lodge sites. Its original length may be considered to have been equal to specimen *b* of the same figure, or about thirteen inches. The wear at the broad end of the blade consists of a rounding off of the edge, but without the degree of polishing which is generally so marked in the used spades and hoes. It was doubtless hafted and used in digging.

QUARRY TOOLS FOUND IN THE TRENCH (ONE-HALF NATURAL SIZE)

The hammers (plate I) were provided with short handles, shaped out of the stone, and in every instance presented a pol-

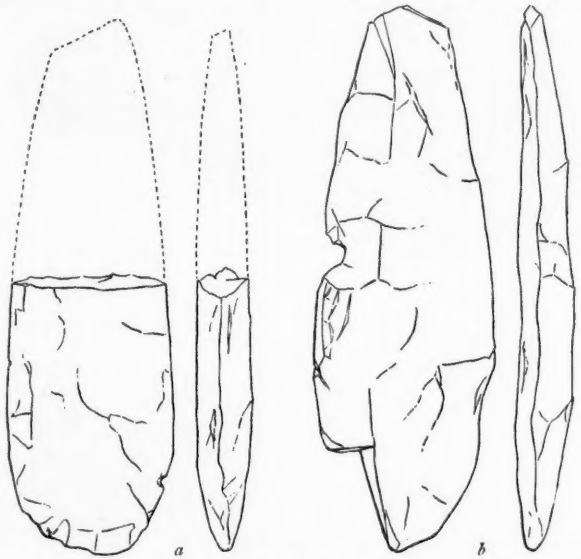

FIG. 4—Quarry tools. *a*, used half-blade found in the trench; *b*, from a lodge site. (One-fourth natural size.)

ished area on the flat side of the hammerhead (figure 5), presumably from friction and contact with the thumb while in use. It seems likely that this tool was used in a flatwise position in the hand (figure 6), and with an upward stroke, judging from the flaking at the heavy end, and that its function was to loosen the nodules from the clay. If this interpretation is correct, the specimens are in the main right-handed examples. The average length of this tool is eight inches.

FIG. 5—The use-marks on the quarry hammer.

Accumulations of Shop Refuse.—Shop refuse is abundant on the Hale farm,

QUARRY TOOLS FOUND IN THE TRENCH (ONE-HALF NATURAL SIZE)

at the county line, between the railroad and the creek. A group of mounds on this farm has been described as situated "in the midst of or rather on an immense refuse heap; in fact the whole top of this ridge appears to be covered to a depth of from three to six feet with an accumulation of flint chips, broken pottery, mussel shells, etc. Charcoal, burned limestone, and other evi-

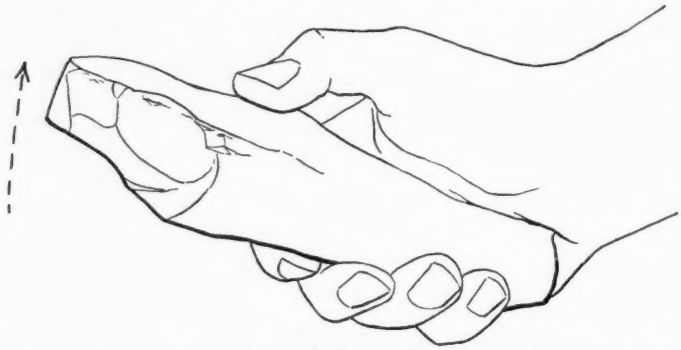

FIG. 6—Probable method of using the quarry hammer. In the position indicated an upward blow would cause the flaking of the heavy end as well as friction under the thumb.

dences of fire are plentifully scattered throughout the mass. The locality would probably be better described as a kitchen heap averaging four to five feet in depth and covering several acres."[1]

An area of three acres about the Hale house is thickly covered with refuse, while this tract might be increased to six or eight acres to include scattered patches. The farmhouse stands on the larger mound, while an orchard, barnyard, and garden occupy at least half of the ridge where the remains are most abundant. The depth of the deposit has been overestimated.

On the hill across the valley at the south, an area of two or three acres offers similar litter, likewise the extension of Pulaski county directly east on the opposite side of the creek.

On the Heilig, Goodman, and Fink farms, southeast of the smaller group of quarries, there are many accumulations of refuse, and here the manner of occurrence is better shown than in the

[1] Thomas, *Mound Explorations*, op. cit., p. 148, map.

confused deposits on the Hale place. Flaking refuse generally in this vicinity occurs in well-defined circular spaces about thirty feet in diameter and from several inches to a foot in thickness at the center. Unfinished, broken, and rejected work, with quantities of flakes, covers the ground with little mixture of soil save at the edges where the material is distributed more sparingly. Such deposits are seen everywhere in the fields, and in spite of repeated plowing are still distinctly outlined. Near the southwest corner of the Fink farm one of these accumulations was trenched. The excavation revealed little concerning the flaking refuse, which could not be made out from inspection of the surface, but besides the chert there was found to be a collection of charcoal at the middle of the space, and fragments of pottery, several broken and used hoes, hammerstones, a limestone tool, and grinding-stones completed the list of mixed objects. In view of this result all similar deposits were interpreted as lodge sites, and on the Hale farm the area so thickly covered with the same mixture of remains must have been repeatedly dwelt upon and used as a site of working until the various deposits joined and possibly lay one above another.

Rejectage, Flakes, and Products. — The main features of rejectage are here essentially the same as in all leaf-blade working, and the principles established by Professor Holmes need only be applied to the special case in hand.

The nodules were eminently suited for flaking, and natural shapes supplied width and relative thinness when required. Remarkable results seem chiefly to be due to a regard for the common cross-section shown in figure 2. A preliminary thick stage was therefore eliminated in a measure from a large portion of the work done, and massive forms do not appear as often as in the rejectage of quarry-shops generally. Thin rejects, on the other hand, are numerous and in any other known group of shops might pass for very successful shaping in the various stages represented.

Again, certain forms intended to be strong and thick have been shaped from thick nodules or in a manner designed to preserve relative thickness. This class of rejectage is very similar to the average forms of waste blades found in the Peoria quarry-shop in Indian Territory and described by Professor Holmes.[1]

The shape of the nodule often supplied a desirable curve on-the-flat which has been commented on in descriptions of the finished products. The rejectage also contains many specimens illustrating the shaping of forms which are prominently convex on one side and flat on the other.

In size and shape rejected blades are exceedingly variable and a wide range of products is easily traced. The forms which pass into broad thin blades (plate II) vary from eight to seventeen inches in length, four to nine inches in width, and one-half to three inches in thickness. Half-blades are common. Long and relatively narrow forms pass into thin knife-like blades on the one hand and into thick celt-like forms on the other. Circular forms are not so frequent. Some highly developed products were finished by grinding on-the-flat, while an edgewise grinding is characteristic of all rejects which have arrived approximately near completion. As a rule the latter operation affected only that part of the implement which was designed to enter into the hafting.

A more striking example of flakage probably does not exist in any similar line of refuse. The flakes are uniformly large, thin, and wide, and commonly are four inches in length where products like the spades have been shaped. Exceptional flakes are of much greater length. Favorable natural shapes with the superior flaking quality of the material were evidently the circumstances which made the spades and hoes possible, whatever may

[1] Bureau of Ethnology, Bulletin U = 21. A visit was made to Peoria for the purpose of comparing the refuse found there with that observed at Mill Creek. Both places have yielded products of large size, and while there are many points of difference and the finished forms of the Peoria material are not yet perfectly known, the two localities doubtless have supplied very similar implements.

AVERAGE REJECT OF SPADE FLAKING FROM THE HALE SHOP SITE (ONE-HALF NATURAL SIZE)

have been the special skill of the worker or his method of operating.

Mill Creek products are among the most noteworthy of the great family of leaf-blades, and deserve a detailed account which is quite beyond the scope of the present paper. They are well represented in museums and are familiar to archeologists. Fifteen or twenty specializations were observed in collections in the vicinity. Implements made here were used in a different class of pursuits from those flaked at Piney branch and Flint ridge. The rejectage which would occur in shaping smaller forms, as projectile heads, is altogether absent.

Tools of the Flaking Shops. — Tools recovered from the shop sites include numbers of flaking hammers of the ordinary type found throughout the country. They are principally of the same material as the stone worked. A few hammers with handles like those found in the trench also occur, but the heavy end is battered about the edge as in the case of the flaking hammer. Stones used for grinding are particularly abundant. Some specimens are of large size and are marked with deep grooves from the edgewise grinding of implements, while others are without grooves and were used for grinding on the flat. Many rejects served as grinding tools (figure 7), the sharp incrustation of the nodules being particularly effective in abrading. Blocks of sandstone were also used.

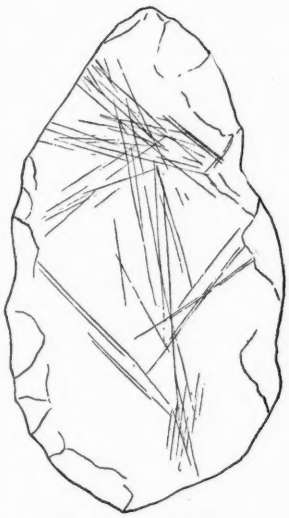

FIG. 7—Reject used as a grinding-stone. Appearance of the common form with marks from edgewise grinding. (One-fourth natural size.)

Associated Remains. — Important remains are associated with the industry which has been described. The stone grave mound

on the Hale farm and the large mound on which the house stands were built at the time of active quarrying and flaking. Refuse is distributed among the cists and mixed with the earth of which the mounds are made; refuse has also accumulated on lodge sites located over the excavation where material for the mounds was dug. Much other evidence is of a character to connect the industry with the ancient race whose works extend through the middle Mississippi valley.

MAYAN TIME SYSTEMS AND TIME SYMBOLS

By CYRUS THOMAS

That the discovery by Mr J. T. Goodman[1] of the signification of certain time and numeral symbols in the Mayan inscriptions, coupled with the discoveries by Dr Förstemann in reference to time counting and also time symbols, must point out and open new channels in the investigation of Mayan hieroglyphics, is evident. The determination of characters which had previously received widely different interpretations must cancel a number of previous speculations, and the discoveries must largely influence future attempts toward interpretation of the inscriptions and codices. While Mr Goodman's ungenerous treatment of co-workers in the same field—ignoring entirely the work they had done, though often appropriating it and building thereon—is calculated to give his monograph an unfavorable reception; and although some of his assumed discoveries must be rejected as lacking proof and his leading theory discarded as untenable, the new light he has thrown on the subject by his real discoveries, when added to that from Dr Förstemann's investigations, will penetrate the mysteries of the inscriptions and possibly also of the codices. The writer may be permitted to say that he makes this assertion after careful investigation, during which he has tested, one by one, Goodman's renderings by reference to the originals as given in Maudslay's excellent photographic reproductions and drawings, accepting only those sustained by absolute demonstration.

The discoveries mentioned consist chiefly in ascertaining the fact that the time periods or orders of units, which are indicated in

[1] *Archaic Maya Inscriptions;* Maudslay's *Biologia Centrali-Americana*, pt. VIII.

the Dresden codex by the relative positions of the numerals, or counters, are indicated in the inscriptions by special symbols. It is well known that among the Mayan tribes the vigesimal system was in vogue, and that to express numbers up to 19 (that is, units of the first or lowest order), they used dots and short lines; but to express units of the higher orders the authors of the codices (at least of the Dresden codex) had recourse to relative position. For example, to indicate 5 units of the first order, 4 of the second, 11 of the third, and 6 of the fourth, they placed them one above another, thus:

Fourth order	6 =	28,800
Third order	11 =	3,960
Second order	4 =	80
First order	5 =	5
		32,845

— twenty of the first order making one of the second, 18 of the second one of the third, 20 of the third one of the fourth, and so on; the number of the second order to make one of the third having been changed in time counting from the regular vigesimal order to 18, apparently to conform to the number of months in a year and thus to facilitate counting. It is apparent, therefore, that the value of one unit of each of the different orders in time counts was as follows, the day being the primary unit:

First order	1 day
Second order	20 days
Third order	360 days
Fourth order	7,200 days
Fifth order	144,000 days

Now, Mr Goodman has discovered that in the inscriptions the orders of units (or real time periods as he believes them to be) were indicated not by relative position, but by specific characters. To these orders of units (or time periods, as he terms them) he

has applied (except the first) arbitrary names, as follows: To the first or lowest, day or *kin;* to the second, *chuen;* to the third, *ahau;* to the fourth, *katun;* to the fifth, *cycle;* and to the sixth, *great cycle;* each having its symbol.[1]

Mr Goodman has further discovered that in the inscriptions a date is frequently followed by a number series and this by another date, and that, as in the codices, this intervening number indicates exactly the lapse of time from one of the given dates to the other. As this, when several times repeated with different dates and different numbers, amounts to actual demonstration, we are compelled to accept his claimed discoveries as real, so far as thus proven. As I have presented in detail, in a paper now in course of preparation, the data verifying these discoveries so far as the data afford demonstration, a simple statement of the fact must suffice here.

Although credit is due chiefly to Dr Förstemann for demonstrating the method of expressing high numbers in the Dresden codex, which has been followed with further evidence by the writer, I may note in passing that we seem to have overlooked the fact of the near approach of this method to that of the

[1] Although we speak of this discovery as Mr Goodman's, yet we would do Dr Förstemann injustice if we should overlook the fact that part of the credit is due to him. Not only had he discovered and applied to the time series in the Dresden codex the orders of units accepted and used by Mr Goodman, but in fact had determined as early as 1891 the value of the symbols designated *ahau* and *katun* by Mr Goodman, as appears from his article "*Zur Maya-Chronologie*" in the *Zeitschrift für Ethnologie* for that year. Mr Goodman's paper was not published until 1897, although it appears from his preface that it was completed in 1895. If Dr Förstemann had not seen Mr Goodman's paper when his article titled "*Die Kreuzinschrift von Palenque*," was published in *Globus* in 1897, and it makes no reference to the former, it is evident that he had discovered independently the value of the symbols which Mr Goodman designates *chuen* and *cycle*. It is evident also from the figures (numbers) he gives in his "*Zur Entzifferung der Mayahandschriften*," IV. (1894), that Dr Förstemann had discovered as early as June, 1894, the value of most if not all the five time-period symbols, as these figures are based on the series found on the stelæ and altars at Copan, as given by Maudslay. To the 360-day period Förstemann applied the name "old year," and to the 7200-day period the name "old *ahau*"; but he failed to discover their use. The chief credit therefore for this important discovery should be given to Mr Goodman.

ordinary decimal system of the present day, which has been suggested — though not expressly dwelt on therein — by reading Professor McGee's able paper on *The Beginning of Mathematics*[1]; in the one, as in the old Babylonian notation, it is by steps upward, in the other by steps to the left.

One important result of Mr Goodman's discovery is the evidence it furnishes of the strong similarity, if not absolute identity, of the time systems or calendars of the different Mayan tribes. To call attention to this point is the chief object of this paper. By means of his discovery we are enabled to determine positively the dates where the symbol is obscure or doubtful, and the numeral or time-period symbols where they vary from the typical forms. It was in this way that the advance in the interpretation of the time and numeral symbols of the Dresden codex was made and the explanation of their use and office was given.

The names and order of the days of the month given for the Maya (i. e., the Maya proper, or Yucatecs) and the Tzental and Quiche-Cakchiquel tribes, as based on historical evidence, are as follows:

Maya	Tzental	Quiche-Cakchiquel	Maya	Tzental	Quiche-Cakchiquel
1. Imix	Imox	Imox	11. Chuen	Batz	Batz
2. Ik	Igh	*Ik*	12. Eb	Euob	*Ee*
3. Akbal	*Votan*	Akbal	13. Ben	*Been*	Ah
4. *Kan*	Ghanan	Kat	14. *Ix*	Hix	Balam
5. Chicchan	Abagh	Can	15. Men	Tziquin	Tziquin
6. Cimi	Tox	Camey	16. Cib	Chabin	Ahmak
7. Manik	Moxic	*Queh*	17. Caban	Chic	*Noh*
8. Lamat	*Lambat*	Canel	18. Ezanab	*Chinax*	Tihax
9. *Muluc*	Molo	Toh	19. *Cauac*	Cahogh	Cooc
10. Oc	Elab	Tzi	20. Ahau	Aghaual	Hunahpu

The names in italics are the supposed dominical days in the calendars of the different tribes. That the dominical days of the Troano codex, which is generally attributed to the Maya of

[1] *American Anthropologist* (N. S.), vol. 1, October, 1899.

Yucatan, were *Kan*, *Muluc*, *Ix*, and *Cauac*, is conceded; and that those of the Dresden codex, which are known to correspond with those of the inscriptions at Palenque, were *Akbal*, *Lamat*, *Ben*, and *Ezanab*, is also admitted. Goodman, it is true, shifts the initial day, but his method of counting gives the same result. It is seen, however, by reference to the list, that the three calendars, according to the historical evidence, begin the years with different days, it being assumed that the names opposite one another in the lists are equivalents so far as relative position in the series is concerned. Although the parallel names (names occupying the same relative position) differ considerably from the standpoint of morphology, some are but equivalents (as to signification) in the different tribal dialects; but this does not apply to all, as is evident from the efforts of Drs Brinton and Seler to bring them into harmony.[1] *Imix* and *Imox*, *Ik* and *Igh*, *Kan* and *Ghanan*, *Cimi* and *Camey*, *Lamat* and *Lambat*, *Muluc* and *Molo*, *Ix* and *Hix*; *Eb*, *Euob*, and *Ee*; *Cauac*, *Cahogh*, and *Cooc*; and *Ahau* and *Aghaual*, are merely different forms of the same names. But this cannot be said of *Votan* and *Akbal*, *Kan* and *Kat*, nor of most of the other corresponding names.

Turning now to the codices and inscriptions, let us compare the days as represented symbolically in the different sections where found. Of course we cannot say positively to what tribes or to the ancestors of what tribes the inscriptions in the ruins of the different sections are respectively to be attributed. All we can assert positively is that they are Mayan; that those of Palenque are in what is or was the country of the Tzental and Zotzil; those at Menche (or Lorillard city) in the country of the Lacandon; those at Copan and Quirigua in the country of the Quiche and Cakchiquel; and those at Tikal in the country formerly occupied by the Itzae. Nor can we say that uniformity in the form of the day symbols proves positive identity in the names, allowing

[1] See also the writer's paper *Day Symbols of the Maya Year* in the Sixteenth Ann. Rep. Bur. Am. Ethnology (1897).

for the variation necessary to express the same idea in the different tribal dialects; nevertheless it tends in this direction, and undoubtedly indicates unity of origin.

That there are in the inscriptions forms of some of the day and month symbols and peculiarities in other characters not observed in the codices is true. But considering what has been stated by early writers as to the names and order of the days and months among the different tribes, the agreement in the forms of the symbols and in the order of the days and months in the inscriptions is remarkable. Take, for example, the day *Ahau;* although we meet here and there with a face form, the usual symbol at Palenque, Tikal, Menche, and Copan is the same as that found in all the codices. The same is true of the symbols for the days *Ik*, *Akbal*, *Kan*, *Ben*, *Ezanab*, *Lamat*, *Chuen*, and one or two others. *Cimi* and *Caban* vary slightly from the typical form; *Muluc*, *Eb*, *Men*, and *Ix* are of rare occurrence in the inscriptions. Another fact which has an important bearing in the comparison of systems is that each holds its relative position throughout the series in precisely the same order as in the Dresden codex. There is no known variation from this rule. Not only so, but the proof is clear that the years are counted from the same dominical days. For example, we find *Ahau* occurring on the 3d, 8th, 13th, and 18th of the month; *Akbal* on the 1st, 6th, 11th, and 16th, which can be true only when *Akbal*, *Lamat*, *Ben*, and *Ezanab* are the dominical days or year-bearers.

Concerning the question as to how far the similarity in the form of the day symbols can be taken as an indication of a similarity in the names, the following facts are noted: The day *Votan* in the Tzental calendar stands in the place of *Akbal* in the other calendars. Now, *akbal*, in both Maya and Cakchiquel, signifies "darkness," "night," and "to grow dark," or "become night"; while *Votan* is the name of a hero-god formerly much venerated by the Tzentals. *Votan* or *uotan* is supposed to signify "heart" in the Tzental dialect, and according to Nuñez de la

Vega he was called "The Heart of the Nation." Yet the symbol of this day is remarkably uniform in the Dresden codex and in all the inscriptions where it appears. The same is true of *Kan*, *Lamat*, and *Ezanab*, which never appear as face characters. As it is admitted that *Votan* is not equivalent to *Akbal*, its corresponding name, *Kat* to *Kan*, nor *Canel* to *Lamat*, how are we to account for the uniformity in the symbols of these days in the several regions which the tribes mentioned are known to have inhabited?

However, the widest variation between the historical evidence and that of the inscriptions is in reference to the names of the months. In regard to these, as given historically, it may be stated that those of the Maya (proper) and the Tzental-Zotzil and Quiche-Cakchiquel groups differed throughout morphologically and in signification, so far as the latter has been determined, no name in one, with a single exception, being the same as that in another. As compared with those in the Maya calendar, which are —

1. Pop	7. Yaxkin	13. Mac
2. Uo	8. Mol	14. Kankin
3. Zip	9. Chen	15. Moan
4. Zotz	10. Yax	16. Pax
5. Tzec	11. Zac	17. Kayab
6. Xul	12. Ceh	18. Cumhu

those of the Tzental were 1 *Tzum*, 2 *Batzal*, 3 *Si sac*, etc.; those of the Quiche, 1 *Tequexepual*, 2 *Tziba pop*, 3 *Zac*, 4 *Ch'ab*, etc., differing in like manner throughout. So widely different, in fact, are they, that Drs Brinton and Seler made no attempt to bring them into harmony. In fact Dr Brinton says: "While the names of the twenty days of each month are practically identical in all the five languages [including Zapotec and Nahuatl] under consideration, the reverse is the case in the names of the eighteen months which made up the vague solar year. These differ widely

in tribes very closely related, as the Quiches and Cakchiquels; and even in the same dialectic area, as among the Nahuas."

Now, in contrast with this the symbols are not only comparatively uniform in the inscriptions, as shown by the figures given in Mr Goodman's work and in Maudslay's photographs, but with very few exceptions they correspond with those in the Dresden codex. There are also indications that the names were the same as found in the Maya calendar. For example, the symbol of the month *Pop* is characterized by an interlacing figure apparently intended to denote matting; in Maya *pop* signifies "mat." The name of the 4th month, *Zotz*, signifies "a bat," and the symbol, which is always a face form, has an extension upward from the tip of the nose presumably to indicate the leaf-nose bat. But as conclusive evidence on this point, if Mr Goodman is correct in his interpretation, the month is designated on one of the stelæ at Copan by the full form of a leaf-nose bat. So general is the uniformity of the month glyphs, in both the Dresden codex and the inscriptions, that Mr Goodman has not hesitated to apply the names as given in the Maya calendar, and to place side by side those of the inscriptions with those of the codex. "There is not," he says, "an instance of diversity in all their calendars; their dates are all correlative, and in most of the records parallel each other." Of course there are sporadic variations and imperfect glyphs which often render determination by simple inspection uncertain, but this is generally aided by the connecting numeral series.

The change of day symbols from the typical form to face characters is found in the codices as well as in the inscriptions, as is shown by an examination of the Troano codex, where this is of frequent occurrence. The occasional variations of the symbols for the days *Chicchan*, *Cimi*, and *Ix*, in the latter codex, are so radical that identity is ascertained only by means of the positions they occupy in series. It is chiefly on this uniformity that Mr Goodman bases his theory of an archaic calendar.

Another item in the evidence is found in the identity in form

of the time-period symbols or symbols denoting the orders of units. Though face forms are frequently introduced, the typical forms are the same in the inscriptions of each section, and the face characters are used in each. In addition to the localities mentioned, one or two of the former are found in the inscription on a tablet from Tonina, Chiapas; on an amulet from Ococingo, Chiapas; and on a vase from a Quiche tomb, Guatemala; and at least three of the typical forms are found in the Dresden codex.

We therefore have as evidence on this point the similarity in form of the day, month, and numeral symbols; the uniformity in the order in which the days and months follow one another; the use throughout (except by the Maya of Yucatan) of the same days as dominicals or year-bearers; and in fact, throughout, precisely the same time system and the same method of representing graphically its several features. In addition we find represented in the inscriptions of each locality what Maudslay has appropriately termed "initial series," beginning with a large or quadruple glyph, as that with which the inscription on the Tablet of the Cross at Palenque begins (in the upper left-hand corner of the left slab), and also the same order in placing the glyphs with reference one to another; that is, all are to be read in the same direction. These facts, therefore, indicate much closer uniformity in the time systems of the different sections than that inferred from the historical evidence.

What is the deduction to be drawn from the above-mentioned facts? Is Goodman right when he says: "From this is deducible the important fact that — whether a single empire, a federation, or separate nations — they were a homogeneous people, constituting the grandest native civilization in the Western Hemisphere of which there is any record"? In other words, do they not show that when the inscriptions were chiseled the Mayan group was much more homogeneous and the tribal distinctions far less marked than when the Spaniards arrived on the scene? Dr

Brinton[1] says that "in all the Mayan dialects the names [of the days] belonged already at the time of the Conquest to an archaic form of speech, indicating that they were derived from some common ancient stock, not one from the other, and that, with one or two possible exceptions, they belong to the stock and are not borrowed words." The inscriptions seem to go far toward confirming this view, which was based wholly on linguistic evidence, although the opinion would imply either that the Maya of Yucatan are to be regarded as the older division of the Mayan group (excepting the Huasteca), or that they had retained, with less change than other tribes, the original names of the days and months.

If the view herein reached be accepted as well founded, the inscriptions and codices will form in this respect a fixed basis for further research into the history of the Mayan tribes. The next step will be to determine from these records, if possible, the probable age of the inscriptions, for, as appears from what has been shown, the history as derived from the early Spanish writers cannot be fully relied on; and the traditions can only be trusted so far as they agree with the monuments and the linguistic evidence. That Mr Goodman's conclusion in this respect cannot be accepted is evident from the quotation given in a previous communication to this journal.[2]

As will be seen, I have limited this paper to a very brief summary of what may be called one branch of the mathematical evidence. To exhaust it would require a comparison of the number and calendar systems of the Mexican codices. Nor have I broached the mystical use of time periods and numerals by the Maya and Nahua, both of which must have an important bearing on the subject treated.

[1] *Native Calendar*, p. 21.

[2] *American Anthropologist*, N. S., vol. 1, p. 559.

LINGUISTIC FAMILIES OF MEXICO

By OTIS T. MASON

In 1895 Alfonso L. Herrera and Ricardo E. Cicero published in the City of Mexico a *Catálogo de la Coleccion de Antropología del Museo Nacional*, in which will be found Pimentel's linguistic families and Orozco y Berra's list of tribes, more than seven hundred in all. In 1891 appeared Dr Brinton's *American Race*, in which, for the first time, he brought all the tribes of North America and South America into a system. The Bureau of American Ethnology in the same year issued Major Powell's *Linguistic Families of North America*, a model of philological taxonomy. In the last named paper the stocks of Mexico are not mentioned, but in the three works before us there is a starting point for systematic treatment of the tribes of that republic, in which the American Indian population is ten times greater than it ever was within the boundaries of the United States.

Orozco y Berra's list is valuable in that it assembles the names to date. The Bureau of American Ethnology has made an exhaustive synonymy of the United States and Canada, containing many thousands of terms; but there are duplicates, lost tribes, and those whose linguistic affiliations are not known, so that one-half of Orozco y Berra's long catalogue will eventually disappear.

Brinton's work is far in advance of anything before or since on the linguistic families of Mexico, and it is a pity that the author did not go a step further in the adoption of Major Powell's spelling of all family titles. I propose now to take that step and offer the following revision of Pimentel's table which makes the error that generic names shall connote all that the genus includes. A

denotive name is all that we need, coupled with a systematic spelling which shows on its surface whether a tribe, a speech, or a linguistic family is intended. I desire here to acknowledge the assistance of Dr A. S. Gatschet, without whose coöperation I should not venture to propose the scheme.

LINGUISTIC FAMILIES OF MEXICO

Pimentel's List.	*List Proposed.*
Apache	Athapascan
Chontal	Zapotecan (uncertain)
Guaicura y Cochimi-Laimon	Yuman
Hauve	Hauvan
Matlalzinga ó Pirinda	Otomian
Maya-Quiché	Mayan
Mexicana	Nahuan
Mixteca-Zapoteca	Zapotecan
Otomies	Otomian
Seri	Serian
Sonorense Ópata-Pima	Piman (or Nahuan)
Tarasca	Tarascan
Totonaca	Totonacan
Zogue-Mixe	Zoquean

The Apache are stragglers into northern Mexico. Chontal is a term of reproach and should not be used for a family designation.[1] Guaicura y Cochimi-Laimon is connotive, and the family title Yuman must take its place.[2] In Matlalzinga ó Pirinda we have the choice of two names, of which the latter is preferable, but this group is Otomian.[3] Mayan is the simplification of a double name. Nahuan, the most important family in the Western Hemisphere, is the southern branch of Buschmann's Uto-Aztekan (1859; also Gatschet, 1877, and Brinton, 1891). As the matter now stands, there are the Shoshonean tongues for the United States, the Piman for the Sonoran area, and the Nahuan

[1] Brinton, *American Race*, 1891, p. 146.
[2] Turner, Latham, Gatschet, in Powell, *Indian Linguistic Families*, 1891, p. 136.
[3] Brinton, op. cit., 1891, p. 136.

for the great southern group. They may be called separate families, or regarded at present as sub-families. The term Aztekan may be discarded in this connection, since it mixes ethnic and linguistic matters. The Serian has hitherto been regarded as a part of the Yuman family, but recent investigation of linguistic material collected by Mr McGee shows it to be clearly an independent stock. The other names proposed offer no difficulties.

ORIENTAL INFLUENCES IN MEXICO

By WALTER HOUGH

Putting aside the mythical or problematic accounts of ancient landfalls, which to be sure are a fascinating field of conjecture, firm ground is reached at the period when the Spaniards governed the Philippines as a dependency of Mexico.

In former times several waves of Malay colonization swept over the Philippines, displacing one another and the original population of woolly-headed Aetas, but later the Chinese overran and conquered the islands. After a time the Chinese yoke was thrown off by the Filipinos, who, being undisturbed for many years, became inert and fell easy prey to the land-grabbing Spaniards of the sixteenth century. Sebu was taken in 1564–65 and Manila in 1571, fifty years after the discovery of the islands by Magellan.

Early in his reign Philip II saw that voyages to the Orient could better be made from New Spain. In 1545, Ruy Lopez de Villalobos was sent from Mexico, but his expedition, though it reached Sebu, was unsuccessful. Then Philip sent Miguel Lopez de Legaspi, a Mexican, who sailed from Navidád in 1564 by the middle route.

Legaspi was a navigator and warrior of the stern stuff of the age—the Dewey of 327 years ago on the same scene—and to him the Spanish Crown ever owed the Philippines. An important result of Legaspi's expedition was the discovery of the route back to Mexico. Contrary to orders, one of the ships of the expedition, commanded by Alonzo de Arellano, turned back from the Philippines and sailed northward to the islands north of Japan, crossed to the Pacific coast off Columbia river, sailed

southward, and brought up at the port thereafter to receive the golden stream of the East on its way to Spain.

Other complications also made it almost imperative for the Spaniards to reach the Philippines through Mexico. The contests between them and the Portuguese for the possession of the earth had resulted in the famous division of Pope Alexander VI at the beginning of the sixteenth century. This cut off the Spaniards from the former route to the East, when the discovery in 1520 of the Straits of Magellan by that great navigator opened another route, which after several trials proved long and unsatisfactory, and the sailing from Mexico was decided on.

In 1575, Guido de Labazarries was made governor of the Philippines, and from this time the islands were ruled by the viceroys of Mexico. Later the Spanish Crown resumed direct control and appointed governors from the mother country, but commerce was carried on with the Philippines until the separation of Mexico from Spain.

It is an important fact that one of the first cares of Labazarries was the establishment of trade and commerce between China and Manila. This commerce, which was only interrupted by events, had been carried on for centuries, bringing many Chinese traders from the mainland not over 460 miles away.

Many references by De Morga to the commerce carried on between the Philippines and New Spain show that the interchange of products was begun early and that Mexico and the Orient were closely connected.[1] The people of Mexico in this way became familiarized with the products of the East before a similar state of affairs prevailed in Europe, and the going and coming of the viceroys, priests, soldiers, sailors, and traders could not have failed in introducing to Mexico useful plants, manufactures, etc., that have come to be regarded as indigenous products.

[1] *The Philippine Islands*, by Antonio De Morga, London (Hakluyt Society), 1868.

Manila has long been an emporium of commerce. De Morga[1] says: "The merchants and traders form the greater part of the residents in these islands, on account of the quantity of merchandise which flows in to them (in addition to the produce of the country) from China, Japan, Maluco, Malacca, Siam and Camboja, Borneo, and other parts, with which they make their ventures, and every year embark them in ships which sail for New Spain." The same authority gives a general account of the articles forming the basis of the trade, and the list is interesting as showing the great variety which might be selected for trade with New Spain.

This commerce so increased that it worked injury to the trade between Spain and her possessions in Peru and Mexico. In 1599 it was suggested, and later acted on, to limit the amount of Mexican money to be used in the Philippine trade in any one year to $500,000. Just how effective this law was and how much it hampered the free movement of commodities between the countries it is difficult to gather. Perhaps like the prohibition of government officers engaging in trade, it was a good thing if enforced.

It is true in any case that each year for centuries two vessels were dispatched from Manila to New Spain, one a stately galleon, the other a large ship as a convoy on which prohibited goods were carried in a clandestine way. At the time of the arrival of these ships they were joined by other craft coming from Peru and Chili, and it was customary to hold a great fair for thirty days at Acapulco, where commodities from all parts of the world were bartered. Thus Acapulco became the great distributing point whence the commerce of the East was sent to South America. Acapulco, Mexico, and Vera Cruz were the cities in Mexico directly touched by this trade.

During De Morga's time duty of three percent on the merchandise brought from China amounted to $40,000, and the two percent duty on goods shipped to Mexico reached $20,000, while the duty from Mexico to the Philippines was $8000.

[1] *Ibid.*, page 336.

The population of Manila, like that of most seaports having extensive commerce, was of very mixed character, the bulk of the foreigners being Chinese, who, while viewed with suspicion, were recognized as being indispensable because they were industrious workers at all employments and demanded small wages. The same is true at this epoch in the Philippines, and there seems to be as little reason for excluding the Chinese now as there was in the sixteenth century. Owing to trouble with the Japanese in 1597, "the governor sent to Japan all the Japanese who were settled in Manila (and they were not a few) and those who came in trading ships."[1] The Chinese have maintained their hold in the Philippines to the present day in spite of various massacres and the stringent enactments to which they have been subjected. There has been a decided mixture of Chinese blood with the natives, forming the class known as mestizos.

The question may be asked, then, whether the centuries of communication between the East and Mexico have had any marked effect upon either. Perhaps the first marked intrusion of the East into Mexico is to be found in the flora of the country. It was the custom of the priests who invariably accompanied or closely followed the Spaniards on their conquests, to select plants, seeds, and other curious objects for introduction into other lands and as presents to royalty. The world is greatly indebted to the missionary fathers for the dissemination of a multitude of useful and beautiful plants whose presence in various unexpected localities has often perplexed botanists.

The Spanish leaders of explorations were not less active in the search for strange products to illustrate to the rulers the remarkable character of the countries which they gained for Spain. That the Pueblo Indians of our Southwest early possessed sheep, horses, cattle, peaches, wheat, etc., is due to the friars of the seventeenth century, to whom also may be attributed many of the plants of the East now thoroughly at home in Mexico and South

[1] De Morga, op. cit., page 86.

America. The return of the viceroys and merchants, who had made fortunes in the Philippines, was no doubt likewise a potent factor in enriching the flora of Mexico by the plants brought from the Orient to beautify their estates.

Wherever the Chinese go they carry with them their native country. In our cities, whenever feasible, they grow their favorite lily, water-chestnut, and gourds. In one of the southern states a farm is devoted to raising and canning Chinese vegetables for the use of our Chinese colony. This gives opportunity for the escape from cultivation of plants that later on may spread widely. There is no reason to doubt that in Mexico this process has gone on for a long time.

With these statements in view it does not seem anomalous to find the cocoanut on the coast of Mexico with the attendant manufactures connected with the tree, as houses from the trunk, thatch from the dead leaves, cups from the nut, toddy from the flower-stalk, and various other products. The toddy is called *tuba*, a Tagal word, and its collection and preparation and the other arts grouped about the cocoanut palm might be transported bodily from Colima to an island in the Pacific without jarring the scene.

The presence in America of the banana which, like the cocoanut, has been fancifully accounted for as the result of some prehistoric dissemination, bears witness to the contact with the East. The banana, which can be propagated only by living plants, came to Mexico by way of Manila within the last 300 years and has been widely distributed over the tropics of America. The same is true of the plantain.

The mango, the most popular fruit in Mexico as well as one of the most delicious, is also an immigrant from the Philippines. This handsome and useful tree is a native of India, and is now grown in parts of Mexico having suitable climatic conditions. Its dense, dark green foliage gives a grateful shade around the palm-thatched jacals of the Indians in the tropic and subtropic-

landscapes of Mexico. There are a number of varieties of the mango in the temperate regions, the one most prized being the large yellow subacid kind called "mango de Manila."

Another East Indian fruit, called by the Mexicans *piña-nona* (*Monstera deliciosa*), is naturalized in the tropic and subtropic zones of Mexico and is frequently offered for sale in the markets.

The list of useful plants introduced from the East into Mexico, probably by way of the Philippines, could be extended, but enough has been presented to show the strong current which began to flow at the close of the sixteenth century. Of ornamental plants and trees also there are not a few naturalized in Mexico. Among these may be mentioned the Chinese umbrella tree, the pepper tree (*Schinus mollis*), whose habitat is Australia or India, but which flourishes in Mexico as does the ailanthus in the United States. In the beautiful plazas, a graceful feature of every town and city, one sees rare exotics whose home is in the East.

The debt of the Philippines to the New World must be acknowledged in this connection. The century plant, the prickly pear, and the pineapple came from Mexico, the last furnishing fiber for the *piña* cloth for which the Philippines are famous. The Spaniards early sought to introduce the grape and the olive, fig, pomegranate, and other trees from Castile into the Philippines. Only pomegranates and grapes were successful, and it was found that green vegetables of Spain did not produce seed, an experiment showing lack of judgment.

If, as it seems true, Mexico is indebted to the East for many plants, one should look for traces of that contact among the arts of the country. Search for objects of this kind is one of the most difficult of undertakings. The disintegration of aboriginal populations under contact with the higher races leaves little except the thrum ends of former arts, giving scanty material for restoration.

A number of evidences have been observed, one of which, the making of *tuba*, or palm wine, has been noted. Three kinds of rain-coats were seen in use in Mexico by the writer: (*a*) the coat

made from pieces of natural texture out of the spathes of palm sewed together; (*b*) the coat consisting of an oblong mat of palm leaves which may also serve as a bed or be rolled up and carried on the back, and (*c*) the coat which outside resembles a thatch, the inside showing the construction by an ingenious looping and knotting of strips of palm leaf with or without attachment to a cord. This last coat envelops the body, extending down below the knees and is tied about the throat. The resemblance of this garment to those of China and Japan is striking, and is not superficial, having points of similarity of construction which appear to indicate that this particular variety of rain-coat was borrowed from the East. In the Philippines there are worn palm rain-coats apparently similar to those of China and probably introduced by the Chinese, since the Malays do not employ this form.

Certain grooved stone mauls or beaters for the manufacture of bark cloth or paper found in Mexico, seem to point to the migration of an art to America from Polynesia, before the Conquest, by way of eastern Asia across Bering strait. The stepping stones are the Indo-Pacific islands, Japan, the northwest coast of America, and southeastern Alaska, Mexico, Central America, and South America. There seems also to have been an introduction of the grooved club of wood (*tapa* beater) into Costa Rica and Honduras from African sources through slaves, who brought into America the *marimba*, a series of wooden tablets with gourd resonators mounted in a frame and struck with hammers to produce music. On the other hand some forms of the Mexican *marimba* are similar to the Malay instrument in not possessing resonators, which shows derivation from the East.

A discussion of the origin of the musical bow has recently appeared. It is generally agreed that the musical bow is not an American invention, and that its presence in the west may be attributed to importation from Africa. It is likewise found among the Malays, who also probably derived it from African peoples. Curiously the fact is brought out that no stringed instruments

were known to the American aborigines prior to the Conquest,[1] so that all instruments of that character found among the native people may be assigned to sources in the Old World.

The *machete* resembles the jungle knives of the East, and it is possible that there may be kinship or community of origin. The introduction of iron into Mexico was by the Spaniards, but Eastern implements of iron may have reached portions of Mexico before those of Spain.

The primitive rope-twisting tool in use in Mexico may be from the Philippines. This device consists of a billet of wood revolving by one end on a movable axis held in the hand, the revolution of the billet twisting the thread attached to it near the axis. The wide range of this simple twisting appliance renders it difficult to trace its origin, but there is strong presumption that it came from the East into Europe or Mexico.

The houses of the Indians in some localities of Mexico show marked traces of foreign influence. For instance, at Ometepec, near the western coast, where there are many negroes, the houses are circular after the African style. It is likely that all the circular houses in Mexico are of African origin, as the native houses are rectangular. The jacals of the Totonacos of Jalapa, with their high thatched roofs having the profile of a truncated pyramid, resemble strikingly the houses of the East Indies, but it is hardly possible to say that the architecture is not indigenous.

A few American games have affinity with those of the Orient. Mr Culin has traced the analogue of the Hindu *pachise*, under the name *patole*, from the ancient Aztecs to the existing Pueblos of New Mexico.

It is well known that various foreign elements have been incorporated into the population of Mexico during historic times. The central plateau shows the marked effect of immediate contact

[1] O. T. Mason: *Geographical Distribution of the Musical Bow*, American Anthropologist, Nov., 1897. Henry Balfour: *The Natural History of the Musical Bow*, Oxford, 1899.

with the Spaniards in the deterioration of the dominant tribes of that region and their fusion into the great complex called linguistically "the Mexican family." On the east and west coasts the tribes are less modified by Spanish influence, and in the sierras and south of latitude 20° the natives remain vigorous and but slightly modified, some tribes in the mountains preserving their primitive state.

In the tropical region one finds the introduction of foreign races most noticeable. The difficulty of securing native labor to work on the plantations, railroads, etc., has led to the employment of great numbers of Chinese, negroes from the West Indies, and Kanakas or other Polynesians. During the colonial period the plantations of Mexico were worked by slaves from every clime, felons, and impressed labor from the native tribes. It is necessary to take into account the effect of these intrusions of the blood and arts of the Mexicans, and in them it is known to be of profound importance.

That there has been a grafting of Chinese and especially of Negro on the Mexican tribes is evident. The writer has observed a number of mestizos of Chinese and Mexican Indians, finding the cross virile and healthy, quite different from the Eurasians, and partaking much less of Chinese than of Mexican characteristics. As in Manila the union is always with Chinese males. The Chinese mixture is perhaps small, and the common terms by which race mixtures are known in Mexico are applied to mixtures of Spaniards, Indians, and Negroes. The names are Mestizo, Mulato, Zambo, Castigo, Morisco, Zambo prieto, Español, and Salta atras of the primary mestizos. The secondary mestizos are called Calpan mulata, Chino, Tenti en el aire, Lobo, No te entiendo, Gibaro, Ahi te estas, Albarrazaso, Cambujo, and Zambo (of the sixth blood).[1]

[1] R. E. Cicero, in *Catálogo de la Coleccion de Antropología del Museo Nacional*, page 86.

THE STUDY OF PRIMITIVE MUSIC

By CHARLES K. WEAD

In an old number of the *American Anthropologist* (January, 1889) I have chanced on an article by Dr Boas, which has a suggestiveness and significance in a direction quite different from that considered by the author. In opposition to some then current loose theories of "alternating sounds" and "sound blindness," he pointed out the great liability we are under of misunderstanding a new word by failing to perceive the peculiar character of each phonetic element; this point he illustrated by instances from his own notebook of Eskimo words, and added that in the field-notes of even well-trained philologists their misspellings of strange words betray their own nationality. Other easily accessible illustrations we may find in the various spellings of the same name in the Index to the *Documents Relating to the Colonial History of New York*, or in the changes that English words undergo when spoken by natives of Hawaii, or in the rival spellings Chippeway and Ojibwa. Clearly the trouble comes, as Boas pointed out, from the difficulty, first, of apperceiving the elements of the word, and, second, of expressing them in proper notation. Our standards both of recognition and expression are incommensurable with those of the stranger; so the transliteration may be made approximately in various ways, and is at best imperfect even with the copious scientific alphabets.

All these remarks concerning strange words seem nowadays mere truisms; but the more obvious they seem to anyone, the more strange it should appear to him that the parallel truths concerning music are so generally ignored or even denied. The purpose of this paper is to consider some of the difficulties

connected with the hearing and noting of strange music, and some helps in overcoming these difficulties.

The observer of savage or other strange music, *e. g.* a song, hears a succession of sounds differing in pitch, duration, or force, or probably in all three respects and in others not necessary now to consider; and within the limits of the voice the possible variation in each characteristic is continuous,— the sound may be of any force, length, or pitch; so the sounds not being limited in number like consonants or chemical atoms, it is a matter of extreme difficulty to observe and estimate them quantitatively, and, if estimated, the observer has probably no suitable notation for recording his results. At present the familiar symbols for noting the force and length of the notes are generally sufficient to mark the rhythm as closely as it can be observed; but at Chicago some savage rhythms completely baffled the musicians who attempted to note them down. To give the pitch, the general practice of ethnologists seems to be to learn the song, fix on the keynote from the feeling instinctive to a European musician that the notes group themselves in familiar relations around one which is peculiarly a tone of repose, and then transpose the whole so that in writing on the staff there will not be many sharps or flats in the signature: at some point in the process all the notes that do not belong exactly to the scale on the chosen keynote, with its limited number of steps, are changed to the nearest scale-note, though sometimes accidental semitones are allowed. The song thus noted contains also the observer's errors, and his interpretations; it has now many features of the dress of civilization, but its savage nature is not completely disguised; so, to permit it to enter good society, Mr Sousa will fit it out with full harmonies for a brass band [1]; or (dropping the figure) Professor Stumpf [2] will demand that it be "intelligible as music," and arbitrarily change the notes as published so as to satisfy his notions of key. Why

[1] *National, Patriotic, and Typical Airs*, 1890.
[2] *Viertelj. für Musikw.*, 1892.

not as well try to make Zulu words "intelligible as German" from the collocations of the letters in transliteration?

The use of a phonograph has often been proposed to avoid the errors of field observation and to allow of the transcription of melodies under conditions favorable to scientific accuracy. It is found, however, that great care is needed to avoid introducing various new errors; and unless the driving power is uniform the determination of pitch is very uncertain. For this reason the cylinders of Zuñi melodies collected by Dr Fewkes in the early days of field phonographic work were imperfect, and Mr Gilman's thorough examination of them and his published transcriptions (1891) are unsatisfactory as to results, though his method of work was distinctly in advance of any former work. In this connection it is pertinent to add that travelers who get phonographic records should aim to obtain several records of any important song from a single individual, and other records of the same song from other people; only by a comparison of such supposed duplicates will it be possible to tell how much constancy a tune has and what its average constitution is.

If any reader of these pages has the opportunity to observe unusual music, as among Indians, Negroes, uncultivated singers, etc., his observations will be far more interesting and valuable from a scientific point of view if he can adopt two suggestions:

First, train his ear to recognize and *estimate* fractions of a semitone; this may conveniently be done as follows: Paste on the finger-board of a violin a paper scale divided into equal parts, as tenths of an inch, and determine by ear or by comparison with a well-tuned piano at what points the strings must be stopped to produce the notes of the chromatic scale; the average distance between these points will be about half an inch; since, however, the string may be stopped at any intermediate point, notes not in the scale can be produced and their pitch fixed to a tenth of a semitone; so the ear may be trained to estimate both minute intervals and deviations from the piano scale: a bit of wood will be

better than the broad finger for stopping the string with exactness. One German musician trained himself to estimate with certainty at public performances deviations of a tenth of a semitone.

The second suggestion is that the observer record his results, not on the ordinary staff with its lines sometimes three and sometimes four semitones apart, but on a chromatic staff having thirteen equally-spaced lines to the octave; for convenience those lines may be drawn heavier which correspond to the white keys of a piano or the syllables of the diatonic scale; all sounds agreeing exactly in pitch with piano notes will then be written on the lines, while in the spaces notes of intermediate pitch will be properly interpolated. This staff or chart, used by the phonologist Steele a century ago, and invented by patentees and scientific men several times since, is the only one fitted for scientific use in the study of non-harmonic music, for it complies with the demands both for mathematical precision and for musical intelligibility, and the records on it can readily be translated into sound, as with the violin or voice, or to the nearest semitone with the piano. To familiarize oneself with this staff, it is a good exercise to lay down on it the "just" diatonic scale, the Siamese scale of seven equal steps, and any other curious scales the student may know of.

In conclusion: It is sometimes asserted that the deviations of, *e. g.*, Indian music from our scale are immaterial and of no significance: perhaps so, but the people who say so furnish no facts, and ask to have their dictum accepted. Unquestionably the deviations of some Negro songs and of many Oriental tunes are material and intentional, and are as significant of history and relationship as the silent letters in many English words. If, however, the deviations in the tunes of any people should be proved to be non-significant, we shall learn therefrom that the enjoyment of music is not generally dependent on that most modern demand of the harmonic musician,—accuracy of intonation,—and that the simple music of primitive peoples does not need the firm

harmonic foundations of German folk-song or modern music. In either case we may be sure the careful study of these deviations will not only train the observer, but ultimately bring new and valuable truths to light. And in all work on alien music it is to be hoped the field-worker will take warning from the experience in a similar field of the distinguished ethnologist cited at the beginning of this paper, and strive always to obtain and to report the objective truth, free from all subjective interpretations.

THE NEW-FIRE CEREMONY AT WALPI

By J. WALTER FEWKES[1]

Introduction

Among the Hopi the making of the new fire in each November is one of the most important ceremonies in their ritual. The collection of rites of which the New-fire is the most striking is called *Wüwütcimti*, from one of the religious societies prominent in its celebration. Every fourth year these November rites become very elaborate, and are then called *Naacnaiya*, from the importance of the initiation of novices into the priesthoods at that time. Both the elaborate ceremonials and the abbreviated annual New-fire rites have elsewhere[2] been described, but not in the exhaustive way that the subject merits. As the author witnessed the abbreviated rites in November, 1898,[3] under favorable conditions, he has attempted a new article on the New-fire ceremony, with considerably more detail than has yet been given.[4]

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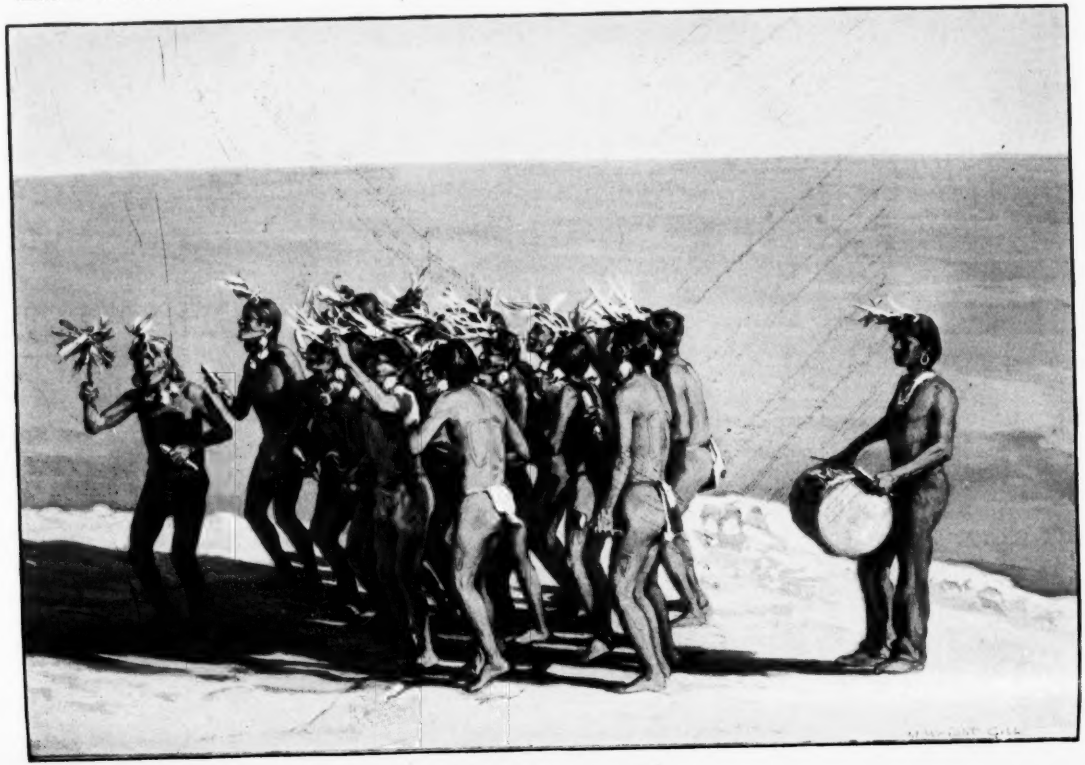
[1] These studies were made under the auspices of the Bureau of American Ethnology.

[2] "Naacnaiya," *Jour. American Folk-lore*, 1892. "Wüwütcimti," *Proc. Bost. Soc. Nat. Hist.*, 1894. The word *Wüwütcimti* is interpreted to mean the ancient dance, or ceremony of the wise ancients. Old masks, the names of which are lost, are called *wüyököti*, "ancient heads."

[3] This was the first time that the author witnessed these rites among the Hopi Indians. The elaborate notes on the *Naacnaiya*, published under joint authorship with the late A. M. Stephen, were made by the latter, as were those on the abbreviated New-fire published after Mr Stephen's death. Although the author has repeatedly expressed his indebtedness to this able student of Hopi ceremonies, he again takes opportunity to call attention to the services rendered to science by this pioneer in Hopi ethnology.

[4] There is no New-fire ceremony at either Sitcomovi or Hano, but probably all the other Hopi pueblos observe the rite. It is commonly stated that in former times the elaborate New-fire ceremony, or *Naacnaiya*, was celebrated every year, but of late it occurs only at stated intervals.



DANCE OF THE TATAUKYAMÛ

Personnel of the New-fire Ceremony

Four societies of priests, known as the *Tataukyamŭ*, *Wüwütcimtŭ*, *Aaltŭ*, and *Kwakwantŭ*, unite in the celebration of the Walpi New-fire ceremony. The public dances are conducted mainly by the former two, whose actions are of a phallic nature. These two act as chorus in the kiva when the fire is made, but the sacred flame is kindled by the latter two societies. All four organizations are considered powerful, but the fact that the name of the ceremony is practically the same as that of one of the priesthoods does not mean that this society is the most prominent. Hani,[1] chief of the *Tataukyamŭ*, directs the whole society, and Anawita, chief of the *Kwakwantŭ*, personates the Fire-god, in whose honor the most important part of the celebration is performed.

Kivas Occupied in the New-fire Ceremony

Four sacred rooms were occupied in this ceremony. The *Tataukyamŭ* met in the *Moñ-kiva*, which was the only chamber in which fire was kindled with the rotating fire-drills, as elsewhere described. The *Wüwütcimtŭ* society met in the *Wikwaliobi-kiva;* the *Aaltŭ* in the *Al-kiva*, and the *Kwakwantŭ* in the *Tcivato-kiva*. The *Nacab-kiva* was not used in the New-fire ceremonies, but rites were conducted simultaneously in all the others, especially on the last day and night.

Sticks with attached feathers, called *natcis*, were displayed at the entrances of the occupied kivas to indicate that ceremonies were in progress within, and duplicates of the same, called *ketsakwa*, were used in several kiva rites, and were carried by some of the chiefs in the processions and public dances as badges of office. The *natcis* of the *Moñ-kiva* and *Wikwaliobi-kiva* were sticks, about a foot long, to the ends of which bundles of hawk-feathers were attached. The *natci* at the entrance to the kiva in

[1] Hani was appointed by the Indian Agent as Governor of Walpi, but Turnoa is the Hopi *kimoñwi* or governor.

which the *Kwakwantû* society met, was an agave stalk, at one end of which were attached several crane-feathers and a circlet of cornhusks. The chief of this society used a similar object in the rites about the medicine-bowl, beating time with it on the floor as an accompaniment to the songs. These *natcis*, with one exception, were set in the straw matting of the kiva hatches on the day of Assembly, and remained there during the ceremonies.[1] The *natci* of the *Aaltû* society was not displayed on the kiva hatch on Assembly day, but was first seen on the day called *Komoktotokya*. It consists of a cap-shaped object of basketry, to which are attached two small whitened gourds in imitation of horns, and closely resembles the horned cap worn by novices in this society.

Ceremonial Days of the Abbreviated New-fire Rites

There was remarkable uniformity in the dates on which the *Wüwütcimti* was celebrated at Walpi in 1892, 1893, and 1898, which were the same and as follows: November 8, *Tcotcoñyuñya*, Smoke assembly; 9, *Tiyuñava*, Announcement; 10–12, ————; 13, *Yuñya*, Assembly; 14, *Sockahimû*, All rest; 15, *Komoktotokya*, Wood gathering; 16, *Totokya*, *Totokpi*, *Piki* making; 17, *Tihuni*, Pudding-feast representation (*Pigumnovi*).

For several days before the ceremony began, large quantities of wood were piled near the kiva hatches, and after the rites began this fuel was carried down into the rooms and continually fed to the flames of the new fire by an old man who never left his task. The flames of the new fire were regarded with reverence; no one was allowed to light a cigarette from it or otherwise profane it.

November 8 — Tcotcoñyuñya or Smoke Assembly

The chiefs of the four societies assembled for their smoke-talk in an old house of the *Asa* clans, east of the *Wikwaliobi-kiva*.

[1] The *natci* is generally put in position at sunrise and is taken down at sunset, a pinch of meal being cast toward the sun when this is done.

This house is owned and occupied by an old woman named Wukomana, the sole female survivor of the *Asa* clan in Walpi, and during the smoke she slept in one corner. It is highly significant that this preliminary gathering occurred in this room, considering that the son of the occupant is chief of the society from which the New-fire ceremony takes its name, and which met in the adjoining kiva.

The smoke assembly of the New-fire chiefs was formerly held in one of the dilapidated rooms[1] west of the kiva mentioned, near the head of the stairway trail. When this room became so dilapidated as to be uninhabitable, the meeting-place was moved to a house on the other side of the kiva, now occupied by the old woman, Wukomana; but this room cannot be used for many more years, and will probably be abandoned at the death of the present occupant.

The following chiefs participated in the smoke assembly in this room in 1898: Hani, *Tataukyamû* chief, *Piba* clan; Anawita, *Kwakwantû* chief, *Patki* clan; Suñoitiwa, *Wüwütcimtû* chief, *Asa* clan; Tuwasmi and Kotka,[2] *Aaltû* (dual) chiefs, *Asa* and *Bear* clans.

In the southeastern corner of this room there is an ancient fireplace around which the chiefs gathered, sitting in a semicircle, Hani at the extreme right, next to him Tuwasmi, then Kotka, Suñoitiwa, and, on the extreme left, Anawita. Hani made a small fire, and Anawita acted as a pipe lighter. Each chief brought his bag of native tobacco, as well as his own pipes, some of which were of most ancient pattern. The gathering took place shortly after sunset.

After the chiefs had smoked for some time, Hani took a ball

[1] The writer has been told that Hani's mother, Tciwüqti, once lived in this room. The smoke assembly in 1893 was held in her home in Sitcomovi.

[2] In the other presentations of the New-fire ceremony which have elsewhere been described, Kotka was not old enough to take this part, hence Winuta officiated for him. Winuta, however, belongs to the *Pakab* people; one of the dual chiefs of the *Aaltû* must be the Bear chief, who is Kotka.

of cotton string and measured off four equal lengths which he twisted together and tied a yellow-bird feather at the end. This string with attached feather is called *pu'tabi*, and on the morning of the following day, at the faintest dawn of light, it was laid by Hoñyi in the trail at the narrowest point of the entrance to Walpi. Hani measured off a second long string and several smaller ones to which he tied feathers and laid them on the basket tray of meal before him. The other chiefs then opened their feather boxes, and each made *nakwakwocis*, which, before placing in the tray, they held to their mouths, breathing an inaudible prayer as they did so.

After all had made these prayer-offerings and tied up their feather boxes, Anawita lighted a pipe and passed it to Hani, who smoked for some time upon the offerings and puffed in sequence to the cardinal points. Hani then passed the pipe to Tuwasmi, who smoked on the prayer-offerings and handed the pipe to his neighbor, Kotka, saying, as he did so, "*Inaa*" ("My father"). Tuwasmi may be ten years or more older than Kotka, but the latter responded, "*Itii*" ("My son"). After a long smoke, Kotka passed the pipe to Suñoitiwa with the words, "*Ikwa*" ("My grandfather"), and this chief handed it in turn to Anawita. Prayers followed the smoke, beginning with Hani, who held the basket tray containing the stringed pine-needles and the long cotton strings in his hands as he prayed. Hani was followed by Tuwasmi, to whom he handed these objects. Shortly afterward the basket tray with its contents was passed to Kotka, and then to Suñoitiwa, who handed it to Anawita, and as each chief held the offerings he fervently prayed in a low tone. At the close of the prayers each chief took a handful of meal and left the room. Anawita said the ceremony was over, and as we passed through the Walpi court he cast a handful of meal over the side of the mesa, near the *Nacab-kiva*.

Hani gathered the offerings which had been prayed over, as above described, and took them, with a lighted pipe, to Hoñyi, the

town-crier, who was sleeping in a nearby house. These objects he handed to Hoñyi with the understanding that in the morning he should announce the advent of the New-fire ceremony.

November 9—Tiyuñava or Announcement

At early dawn Hoñyi went to *Hütciovi*, the narrow place in the mesa just before one enters Walpi, and laid one of the long strings (*pu'tabi*) in the trail, sprinkling there a little meal, and casting a pinch toward the place of sunrise. At the same time he said a prayer, "Our Sun, send us rain." The remainder of the stringed feathers, which Hani had made on the night of the smoke-talk, he carried to the roof of Saliko's house and placed in a radiating position corresponding with the six cardinal points. He cast pinches of meal toward the place of sunrise, and just as the sun appeared above the horizon made the official announcement of the New-fire ceremony in a loud voice. This announcement was not only a summons to the members of the societies to assemble, but also an invocation to the gods to send the desired snow, ice, and rain to water the farms. It was uttered in rhythmic cadence, with verbs prolonged, and could have been heard even among the mesa foothills.

A free translation of the announcement is somewhat as follows:

"All people awake, open your eyes, arise!
Become *Talahoya* (Child of Light), vigorous, active, sprightly.
Hasten, Clouds, from the four world-quarters.
Come, Snow, in plenty, that water may be abundant when summer comes.
Come, Ice, and cover the fields, that after planting they may yield abundantly.
Let all hearts be glad.
The *Wüwütcimtû* will assemble in four days.
They will encircle the villages, dancing and singing their lays.
Let the women be ready to pour water upon them,
That moisture may come in abundance and all shall rejoice."

November 13—Yuñya or Assembly

The first of the five days' continuous rites of the New-fire ceremony is called *Yuñya*, the day on which the priesthoods assemble in their respective kivas. This is not, however, called by the Hopi the first day of the ceremony, but is always referred to as that on which the chief officially enters his kiva.

Early in the morning of Assembly day the writer visited the Walpi kivas and found the chiefs present in all except the *Nacab-kiva*, which is not used in this ceremony. The others had been swept and small piles of twigs had been carefully laid in or near the fireplace ready to be ignited. A quantity of fuel had also been gathered and stacked on the kiva roof in preparation for the coming ceremonies.[1]

Just before sunrise Hani entered the *Moñ-kiva*, carrying his bag of fetishes on his arm, and shortly afterward Suñoitiwa came to his kiva and set his standard (*natci*) in the kiva hatch. Anawita soon placed his *natci* in position, but that of the *Aaltú* was first seen on the kiva entrance two days later.

Early in the morning Hani passed through the pueblo telling all the men to come to their respective kivas, and, as they responded, each, with the exception of members of the *Kwakwantú*, brought with him an ear of white corn. Hani also sprinkled valley sand over the floor of the kiva both on the upraise and on the ceremonial part[2] of the room.

Several important rites were observed and ceremonial objects noted in the kivas on Assembly day, among which the following may be mentioned: 1, An altar to the six directions, at sunrise, in the *Moñ-kiva;* 2, An altar to the six directions, at noon, in the *Tcivato-kiva;* 3, Kindling new fire in the *Moñ-kiva;* 4, Visits of the societies to the shrines of *Tuwapoñtumsi*, *Talatumsi*, and the ancient site of Walpi.

[1] After the new fire is kindled it is not allowed to become extinguished in any of the kivas until the final day of the ceremony.

[2] That portion of the kiva floor east of the ladder is slightly raised, hence its name.

1. *The Six-directions Altar in the Moñ-kiva*

Hani made the six-directions altar on the floor of his kiva at sunrise of Assembly day. A low pile of sand was placed near the fireplace, and six radiating lines of meal were drawn upon it. The medicine-bowl (*nákwipi*) was deposited at their meeting-point, and charm liquid poured into the receptacle. The details of this rite were not observed, but it was probably very much simpler than that of the *Kwakwantû* chief in the *Tcivato-kiva*. In the course of the day Hani tied pine-needles to short strings to use in the sacrifices to the new fire on the evening of this day, as later recorded.

2. *The Six-directions Altar in the Tcivato-kiva*

About noon Anawita prepared six cotton strings, to each of which he attached pine-needles for use as sacrifices to the new fire, as will later be described.

Shortly after noon Cikuli, who acted as medicine-chief in the *Kwakwantû* society, began the installation of objects of the medicine altar to the six cardinal points. He first emptied on the kiva floor, between the fireplace and the western wall of the room, a bagful of common valley sand, and drew upon it, with meal, six lines, radiating from a common point, corresponding to the six cardinal directions, north, west, south, east, above, and below.[1] These lines were made in a sinistral circuit beginning with the north, and after having made them Cikuli deposited a handful of sacred meal at their union, and placed on it the medicine-bowl, which was of rectangular form with a terrace on each of the four sides of the rim. It was without a handle, and on the middle of the inside were painted a frog, and four tadpoles, radially arranged, each facing an angle of the bowl.

The floor west of the ladder is that where the altar is placed and the most important ceremonials are performed.

[1] They are not, however, the true cardinal points, as has elsewhere been indicated, but correspond to solsticial directions.

While Cikuli was arranging the bowl, Anawita unwrapped the birdskins and other fetishes which later were placed at or near the ends of the meal lines. He gave Cikuli directions regarding the disposition of these objects as the arrangement of the altar progressed.

Cikuli first arranged the six ears of corn at the extremities of the lines of meal, setting yellow corn at the north, blue at the west, red at the south, white at the east, black at the above, and speckled at the below—so placed that their tips pointed inward, almost touching the sides of the bowl. He then laid to the left of the ears of corn a number of birdskins, corresponding to the cardinal points, as follows: North, *Tawamana;* West, *Lükätckana;* South, *Mürinyawe;* East, *Posiwu;* Above, *Tokutcka;* Below, *Hotcko.* To the right of the west ear of corn he placed a fragment of a stalactite, and a white stone disk about the size of a half-dollar. At one side of the south ear he deposited a small green stone implement, while on the other side of this ear he placed a section of a crinoid stem. Near the tip of the eastern ear he put a spherical green stone about the size of a marble. Near the black corn corresponding to the direction called the above he placed a stone object resembling a spearpoint, and near the tip of this ear a small stone cylinder.[1]

Cikuli next filled the medicine-bowl about half full of liquid (water?), pouring it in on the four sides in turn, making a pass each time to the corresponding cardinal point, and adding two passes, one for the above, and another for the below. This completed the preliminaries of the Six-directions altar of the *Kwakwantû.*

While this altar was being made there were but three persons, besides myself, in the kiva, namely, Anawita, *Kwakwantû* chief; Cikuli, Medicine chief; Tcali, Smoker chief. All these chiefs had washed their heads earlier in the morning, as is customary in

[1] These medicine stones are identical with those which are often found in ancient graves in Arizona.

preparing for altar and other rites, and the ceremonies began directly after the altar had been made. Tcali first lit the pipe and passed it to Anawita with the words, "*Inaa*" ("My father"[1]), and Anawita responded, "*Itii*" ("My son"). As the pipe was passed from one priest to another it was held near the floor, with bowl foremost and stem horizontal. Anawita blew great puffs to the cardinal points and into the medicine-bowl, after which he handed the pipe to Cikuli, who followed his example, and returned the pipe to Tcali, the Smoker chief, who smoked a little, cleaned the pipe, and then laid it on the floor by the fireplace.

After the formal smoke Anawita began a song, took an agave rod with attached cornhusks and feathers, and beating time with it accompanied the songs. As the singing progressed Cikuli slowly added to the medicine-bowl the stones which lay on the floor near the ears of corn, beginning with that at the north and following with the others in sinistral ceremonial sequence. When this was concluded Anawita gave several quick raps on the floor with his agave stick as a sign for a change in the song.

In the second song Cikuli dipped the heads of the birdskins, one by one, into the medicine, beginning with that at the north and following with the others in sinistral circuit. As he dipped the birds' heads into the medicine he dropped a little pollen at the same time into the liquid.

The third song was accompanied by rapid taps on the floor with the agave rod, and Cikuli drew a line with pollen along the northern ear of corn, and then made a circular pass over the medicine, at the same time dropping a little pollen into the bowl. As the song continued he made similar movements over the ears of corn at the west, south, east, above, and below, holding the pollen to his mouth each time before he made these passes.

At the close of this song Cikuli gathered up the six ears of

[1] Anawita is not Tcali's father, nor do they belong to the same clan. Tcali is a member of the *Piba* or Tobacco clan, consequently a Smoker chief, and his father, who now lives at Zuñi, is named Totci.

corn and laid them side by side across the medicine-bowl. During the fourth song he grasped the medicine-bowl in both hands and moved it with the corn upon it, with a twisting motion, backward and forward, keeping time with the rapid taps of the agave stick on the floor.

In the fifth song Cikuli dipped the end of each ear of corn in the liquid, in sequence, asperged with each to the cardinal points, and laid them back in their former places.

The sixth song was accompanied by a slow beating of the agave stick on the floor, and as it continued Cikuli dipped the tail of each bird in sequence into the medicine, beginning with the north and ending with the birdskin corresponding to the below. A little pollen was added to the liquid as the tail of each bird was dipped into it.

During the next song, which was the seventh in serial order, Cikuli took one of the quartz crystals from the medicine-bowl, sucked it, and handed it to Tcali, who mounted the kiva ladder, and holding the crystal in a sunbeam reflected the light into the medicine.

At the close of the eighth song Anawita prayed, and was followed by Cikuli, after which Tcali filled and lighted the pipe, which, at the close of the prayers, he handed ceremonially to Anawita, exchanging terms of relationship. Anawita smoked for some time, puffing smoke into the medicine, and later passed the pipe to Cikuli, who did the same, returning it to Tcali, the Smoker chief.

3. Making the New Fire in the Moñ-kiva

At 5 P.M. the *Kwakwantû*, led by their chief, Anawita, marched from their ceremonial room to the *Moñ-kiva*. Most of the members of the society were not costumed, but their chief wore a skin rug, and carried in his hand a trayful of meal on which were laid several pine-needles attached to strings. After him came Tcali bearing a cubical fire-stone (plate IV, 2) and a fire-stick, then

followed all the members of the society. As they came to the kiva hatchway each one threw a handful of meal through the opening, which struck the floor near the fireplace.

The *Tataukyamû*, who had already assembled, immediately huddled behind Hani in one corner of the *Moñ-kiva*. As the *Kwakwantû* entered the room they squatted in a group north of the ladder, and Anawita sat on the upraise of the floor near them, where two of their number held up a black blanket before him, concealing him from view. In the rites which followed Anawita personated the Fire-god. Tcali deposited the fire-stone north of the fireplace and squatted beside it with two other *Kwakwantû* members seated near him. The last of this society to enter the kiva was Hayi, who carried an agave stalk painted white, and as he stepped into the room, he drew a line of sacred meal across the middle of the raised part of the floor from the ladder to the northeastern side of the room, and took a position near the right ladder-pole on the northern side of this line of meal. As Anawita entered the kiva he placed his tray of meal with the stringed pine-needles on the floor by the fireplace near the basket belonging to Hani.

The next society to enter the kiva was the *Aaltû* (*Alosaka*), led by one of their chiefs, Kotka, who bore a tray of meal upon which were six triple pine-needle strings. Their advent was announced by balls of meal thrown through the hatchway. The second man in the line carried the fire-board of this society (plate IV, 1). They passed on the southern side of the ladder along the western wall of the room, with the exception of the two chiefs, Tuwasmi and Kotka, who took positions by the fireplace on the southern side. Pautiwa and the two fire-makers of the *Aaltû* society deposited their fire-board to the southwest of the fireplace.

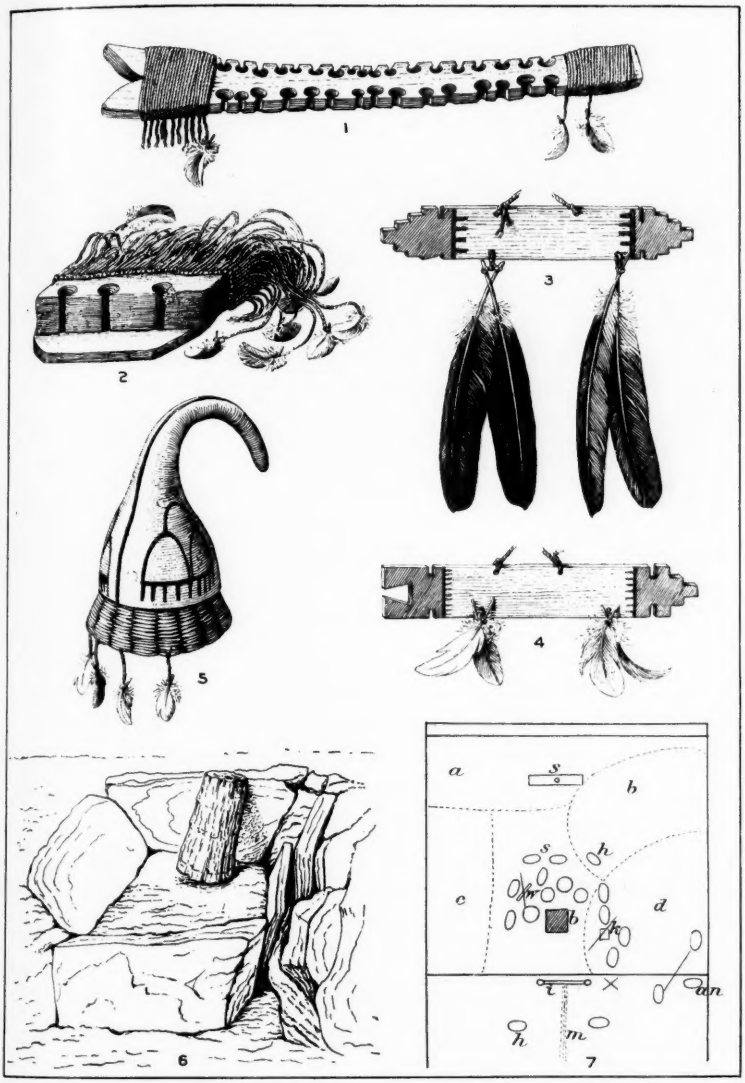
Each *Aaltû* had a white spot on each cheek, and their chief, Kotka, wore the helmet with the artificial mountain-sheep horns of *Alosaka*. He stood at the bottom of the ladder and with an elk-horn directed the incoming men where to seat themselves.

The *Wüwütcimtû*, led by their chief, Suñoitiwa, followed the

Aaltû. Their leader carried a rod to which hawk-feathers were attached, and their advent, like that of the societies which preceded them, was announced by balls of meal thrown into the kiva through the entrance. They passed southwest of the ladder, and grouped themselves in the positions indicated in the accompanying plan (plate IV, 7), but two of their number seated themselves by the fireplace between the *Tataukyamû* and *Aaltû* chiefs.

All those who were to participate, numbering possibly a hundred, were now present in the kiva, and all stood in their respective quarters of the room, the *Kwakwantû* (*d*) in the northeastern corner, the *Tataukyamû* (*b*) in the northwestern, the *Aaltû* (*a*) in the southwestern, and the *Wüwütcimtû* (*c*) in the southeastern, all on the western or ceremonial part of the floor. Hayi remained on the northern side of the line of meal from the ladder across the spectators' part of the kiva, and the man representing *Alosaka* (*h*) at the foot of the ladder on the southern side. Anawita (*an*), shielded by the black blanket held by two men, was seated on the upraise; Hani, Suñoitiwa, and Suyoko stood in a row, the first-mentioned at the left of the line, or at the northern end, facing the fireplace (*b*). The *Kwakwantû* fire-stone (*k*) was north of the fireplace, and two *Kwakwantû* priests knelt by it, one holding each end firmly and pressing it to the floor. This fire-stone was set on a bed of shredded cedar-bark upon which six radiating lines, representing the cardinal points, had been drawn with pollen. During the fire-making, Tcali and a companion twirled the *Kwakwantû* fire-stick, relieving each other at intervals during the rites.

The *Aaltû* fire-board (*w*) was placed south of the fireplace, and was held in position by two kneeling men, one of whom was Tuwasmi. Pautiwa and a companion manipulated the fire-drill of this society. It was laid on shredded cedar-bark on which six radiating lines had been drawn. The four baskets containing meal and the stringed pine-needles of the different societies were arranged in a semicircle between the chiefs and the fireplace in the following order: *Kwakwantû*, *Tataukyamû*, *Wüwütcimtû*, and



CEREMONIAL OBJECTS, ETC.

1, *Aaltû* fire-board. 2, *Kwakwantû* fire-stone slab. 3, 4, *Aaltû monkohûs*. 5, *Kwakwantû* helmet (*tokonaka*). 6, Shrine of Tuwapontumsi. 7, Diagram showing positions of societies in the *Monkiva* when the new fire is ignited: *a*, *Aaltû*; *b*, *Tataukyamû*; *c*, *Wûwûtcimtû*; *d*, *Kwakwantû*; *an*, Anawita; *w*, *Aaltû* fire-board; *k*, *Kwakwantû* fire-stone; *m*, Line of meal from ladder (*i*); *h*, *Alosaka*.

Aaltû, the basket of the last society at the northern end of the semicircle. As soon as all the priests had entered the kiva the fire-makers fitted their fire-drills into the depression of the fire-stone or fire-board, and all the other priests arose while Hani recited a short prayer. Each chief held the badge of his office, and for a few minutes there was silence, which was broken by Hani, who gave the signal to begin, and the members of the *Tataukyamû* and *Wüwütcimtû* began to sing. The *Kwakwantû* accompanied this song with the clanging of their bells, and the *Aaltû* with the rattling of tortoise-shells and deer-hoofs. The two societies appeared to sing different songs, although in unison, and those of the *Tataukyamû* resembled those of the Snake priests at the snake washing.

Almost simultaneously with the beginning of the song the fire-makers began to rotate their drills, corn pollen having been dropped into the slots of the fire-board and fire-stone before the spindles were inserted. The spindle was held vertically between the palms, and in rotating it the top was pressed downward. A second fire-maker relieved the first at intervals, and smoke was produced by the *Aaltû* society in twenty seconds, followed by a spark of fire in about a minute. The *Kwakwantû* produced smoke with their fire-stone in one minute and twenty seconds, and a spark in a minute and fifty seconds. The operation of twirling the fire-drill was the same in both societies,—a man in the middle held the board firmly in place, and the two fire-makers relieved each other every fifteen seconds in rotating the drill. Soon there was a smudge in the cedar-bark which was blown into a flame with the breath, the fire-makers standing as they did so that all might see the new fire. The songs continued and the burning cedar-bark was placed in the fireplace where it ignited the pile of greasewood which had previously been placed there in readiness by Hani. As this wood blazed to the ceiling, the songs ceased. When the fire had burned down to a moderate flame, Hani for the *Tataukyamû* and Euwa for the *Kwakwantû*

societies took the basket trays of their respective societies in their hands, stood before the fire, and prayed, holding the pine-needle offerings over the flame before them. After these prayers each chief dropped six stringed pine-needles into the flame, one for each cardinal direction. Tuwasmi then prayed on behalf of his society, dropping his pine-needle (*nakwakwoci*) into the fire. He was followed by Kotka for the same society, and by Suñoitiwa for the *Wüwütcimtû*. Last of all Anawita, still concealed behind the blanket screen, prayed, to which all vigorously responded with "*Antcai*."

After the chiefs had dropped their offerings into the sacred flame, they again prayed. Twenty-four offerings were made to the fire, six[1] from each of the four societies. The acts of the chiefs in making these offerings were much the same in every case—the pine-needles were brought to the lips and then dropped into the flame with a pass in the direction of the cardinal point for which the sacrifice was intended. There was almost perfect silence as this took place, and after the chiefs had made their sacrifices individual members of the four societies also prayed, and to these prayers Anawita, from behind the screen, replied to all collectively. The prayers were directed to Masauûh, and material blessings were requested.[2]

Shortly after this two of the societies, led by *Alosaka*, left the kiva in the following order: Hani, taking up his tray of meal and certain prayer-offerings, followed by the *Tataukyamû*, went up the ladder, followed by Suñoitiwa leading the *Wüwütcimtû*. The *Aaltû* also left the room, but the *Kwakwantû* remained for some time and did not join the first two societies, which proceeded down the western trail to Old Walpi, as will presently be described.

The line of meal across the upraise of the kiva floor east of

[1] Corresponding to the cardinal points, the places of sunrise and sunset at the summer and winter solstices.

[2] It was said that on each celebration of the New-fire rites Anawita ties a stringed feather to his fire-stone.

the ladder was obliterated by *Alosaka*, and Hayi then went about the kiva brushing the floor where the men had stood, and sprinkling the walls with medicine liquid—a lustral ceremony to offset evil influences. The blanket before Anawita was dropped, and he stepped to the fireplace, said a few words, and then went to the *Tcivato-kiva*, followed by his society. The members of the *Tataukyamû* and *Wüwütcimtû* societies filed off through the western court of the pueblo, and went down the trail to the site of the old pueblo of Walpi and the shrine of *Tuwapoñtumsi* (plate IV, 6).[1]

As soon as the prayers and sacrifices to the new fire had been made, one of the *Aaltû*, who wore two minute antelope or deer horns on his head, ignited a cedar-bark torch and passed with it up the ladder. He went first to the *Wikwaliobi-kiva*, where he ignited a pile of fuel left in the fireplace for that purpose. He then passed on to the *Al-kiva* and the *Tcivato-kiva*, where he did the same, but was careful in each instance to see that the wood was thoroughly ignited before he left the room. Thus the sacred flame was kindled in all the kivas used in this ceremony. The fire thus kindled in these different rooms was regarded with the same reverence as that ignited with the rotating fire-drills, and was not allowed to become extinguished during the remaining days of the ceremony.[2]

4. *Visit to the Shrine of Tuwapoñtumsi and Old Walpi*

When the societies left the *Moñ-kiva*, directly after the new fire had been made, the procession was formed in this order:

[1] A stone enclosure in which is a log of fossil wood. The site of Old Walpi is on the terrace north of the end of the mesa on which the present pueblo stands. Little can now be seen there except mounds and piles of debris, with here and there the tops of the walls of former houses. The Hano (Tewa) name of *Muiyunwû-wügti*, the Goddess of Germs, is *Nañoikwia*, Earth-altar-woman, an exact translation of *Tuwapoñtumsi*. I believe all these names refer to the same personages.

[2] There is no evidence that a perpetual fire is maintained in Hopi kivas or in any place in Walpi, nor is there any association of the new fire with the name Montezuma as is popularly believed.

An *Alosaka*, Hani followed by the *Tataukyamû*, Suñoitiwa followed by the *Wüwütcimtû*, an *Alosaka*. All members were naked, which must have been very trying in the cold air after the superheated kiva exercises. The procession moved to the shrine of *Tuwapoñ-tumsi*, where rites were performed which the writer did not witness. This shrine (plate IV, 6) is among the rocks at the south-western point of the mesa in the foot-hills west of Simo's new house. It is made of flat stones set on edge, open above and on one side. The fetish which it contains is a log of fossil wood 30 c. long by 10 c. in diameter.

After having made their offerings at this shrine the procession moved along the trail leading to the site of Old Walpi, called Kütcaptuvela, on the terrace north of and below the present pueblo. *Alosaka* led the procession in four circuits around a definite space about 150 by 75 feet. This entire area was said to be one great *sipapû*[1] where the wise old men live. Patting his foot on the ground, one of the men in the procession said, pointing downward, "Here, just below here, the old people dwell. We are now," he continued, "praying to them for material prosperity —rain, health, abundant harvests." The *nakwakwoci* deposited here are offered to the early Hopi ancestors who once dwelt there, and who are now believed to be *katcinas* in the lower world. Led by *Alosaka*, the procession encircled the *sipapuni* four times, now and then stopping to deposit prayer-sticks or to drop pinches of prayer-meal in depressions in the rock or elsewhere as directed by *Alosaka*. After these four circuits of the supposed abode of the ancients, the procession passed along the trail leading to the high bluff forming the western point of the mesa, where it halted. Up to this time all had been silent, or spoke only in whispers; but on halting some one said, "*Ta-ai*" ("Come on, begin"), and one of their number uttered some witticism which the writer did not

[1] The orifice through which man came to the surface of the earth from the under world is called *Sipapû*. This is symbolized by a small hole in the floor of the kiva, and the name is often applied to shrines.

understand. All yelled with laughter, and the rocks echoed with their shouts. This was repeated several times, after which the march was again taken up, and in silence they proceeded up the trail to Walpi, through the passage west of the *Moñ-kiva* to their respective kivas. There was half an hour of social conversation in their rooms, after they returned, and soon they rolled themselves in their blankets to sleep. As it was said that there were to be no further ceremonies that night, the author retired about midnight to his room in Sitcomovi for needed sleep.

It is at this stage of the New-fire ceremony that the statuette of *Talatumsi* is brought into the pueblo from her shrine below the mesa and deposited on the hatchway of the *Moñ-kiva*. This does not take place in the yearly celebration, but only in the quadrennial *Naacnaiya*. This image is brought into the pueblo by Kakapti, an *Aaltû* priest, directly after the new fire is made, and is returned to her shrine on the morning of the fifth day. As the rites when this image is returned to her shrine appear to be the most complicated yet observed in connection with the image, I quote the following description of them from a previous work:

"An hour before sunrise the *Tataukyamû* and *Wüwütcimtû* marched to the *Tcivato-kiva* and stood on the roofs (*Tcivato-kiva* and *Al-kiva*) wrapped in their blankets. Their chiefs and those of the Horn society were clustered around the *Talatumsi*, holding meal trays in their hands. All sprinkled the figurine, and the two societies began their fine solemn hymns. The two Horn sentries (*Alosaka*) stood in front of the *Tataukyamû-keles* (novices) at the west end of the *Kwan-kiva* (*Tcivato-kiva*). . . . On the first glimpse of the sun the song ceased and Kakapti took in his hands the *Talatumsi* figurine. The *Tataukyamû* then filed off toward their own kiva (*Moñ-kiva*), and the *Wüwütcimtû* followed them. Nearly all the Horns (*Aaltû*), wearing helmets (horned) and buckskin mantles, and some fifteen or twenty *Kwakwantû* with their helmets, but in ordinary clothing, followed. Kakapti went in front of the Horns (*Aaltû*) bearing the figurine of *Talatumsi*.

"As the *Tataukyamû* reached the stairway trail (*Howina*) they filed past it, all the rest (except *Aaltû*) following to the broad terrace, a little west of the group of homes at that end of the mesa. There the

Kwakwantû, the *Tataukyamû*, and the *Wüwütcimtû* clustered in three separate groups or irregular lines about one hundred yards apart. The latter two societies on halting began their songs. The Horns (*Aaltû*) scattered among the cliffs between the terrace and the summit, and bounded constantly back and forth among the crags, faithfully imitating mountain sheep. The songs continued fifteen minutes, during which time Kakapti placed the figurine back in its concealed niche from which he took it on the first day."

From this account, written in 1892, there seems no doubt that the *Talatumsi*[1] figurine is in the special keeping of the *Aaltû* and is directly associated with the *Alosaka* cult.

November 14—Sockahimû, All Rest

Dance of the Wüwütcimtû

At intervals during this day, and on the two days following, there were public dances of the *Wüwütcimtû* society which began early in the morning and lasted until dark. About an hour after sunrise twenty men of this society, accompanied by a drummer, passed singing through the pueblo. They formed two platoons facing each other, linking hands, with fingers imbricated. Their faces were whitened and they bore zigzag finger-marks drawn down their cheeks, reminding one of the symbolic designs on the masks of *Hehea-katcinas*. All were quite naked, smeared with a band of yellow pigment around the calf and thigh, with a girdle and cross painted on the body, and parallel bands on chest and arms. They directed their songs and obscene remarks to the women belonging to the *Mamzrautû* society in lusty tones, mingled with taunts and songs — "*Hai-ya-a-hai-ya-a*," etc. This singling out of certain women is in conformance with legends, as elsewhere explained in this paper; and it is instructive to note that the same women return the compliment for this and the following day's proceedings in their October rites called *Mamzrauti*.

[1] The Hano (Tewa) name of *Talatumsi* is *Cenikwia*, Horn-woman.

On the sixth and eighth days of the festival the women retort in this way to the taunts of the *Tataukyamû*. On the former day twenty-five women and girls participated, and all rubbed their breasts, arms, and legs with mud before leaving the kiva. Several of them were decorated with zigzag facial marks representing the *Hehea-katcina;* they wore a sheepskin over their shoulders, and in their dance imitated the movements of the personage[1] mentioned.

Nocturnal Patrols of the Novices

From time to time during the nights of several days there were patrols through the pueblo of costumed men carrying cowbells, the meaning of which was discovered by studies in the *Tcivato-kiva*. These patrols were connected with the initiations of novices of the *Kwakwantû* society, and were specially prominent on the evening of the first day. The departure and return of these novices were watched, and one of the parties was followed through the pueblo.

Four lads of about sixteen years of age were initiated into the *Kwakwantû* society, and these were run through the town by an older priest in much the same way as in college society initiations. They were led from place to place at breakneck speed, along difficult trails, in the frosty air. About midnight Kanu, a priest appointed to conduct them, approached the western end of the kiva, and taking from the wall one of the horned helmets (plate IV, 5) hanging in the kiva, put it on his head. He wrapped a skin about his body and took the large elk-horns in one hand and a huge agave stick or club in the other. The *Kwakwantû* have many copper cowbells which they carry in their patrols, and Kanu took one of these from the raised seat at the western end of the kiva. The four novices (*keles*), each one of whom carried an ear of maize, also placed helmets on their heads and took bells

[1] In a collection of dolls gathered by the author in 1892 there is a compound one consisting of two *Palahiko-manas* surmounted by a figure of *Hehea*. There is some connection between these personages, one aspect of which is brought out in the New-fire rites.

in their hands. The company, led by Kanu, started up the kiva ladder, and the clanking of the bells could be heard through the pueblo as they made their patrols. They made their way to several shrines on the East Mesa, running from one to another, and returning in about half an hour. Similar patrols, under leadership of other members of the society, were made during the night, and the explanation of these patrols was said to be simply the initiation of novices.

November 15—Komoktotokya, Wood-gathering

Dance of the Wüwütcimtû

About half an hour after sunrise the members of the *Wüwütcimtû* society emerged from their kiva and sang their song, called the *Me-ha-lo-lol*, through the pueblo. There were a few more participants on this than on the day preceding, and this increase of number continued each day. The singers were escorted from their kiva by two naked Horn priests (*Aaltû*), who wore mountain-sheep helmets and were called *Alosakas*. They carried ears of corn in their right and deer antlers in their left hands.

The dancers formed two platoons facing each other, the members linking arms and clasping hands with imbricated fingers. The senior chief, Suñoitiwa, stood at the right or western end of the northern platoon; he carried in one hand a rod with an attached bunch of hawk tail-feathers, a badge of his chieftaincy. Their song was lively and effective, and a drummer walked between the two lines, accompanying them with taps on an ancient drum. They began a sidelong dance, moving in rhythm with their song, shuffling along a few paces eastward, and then back to their former position. With this strange movement they made their way in front of the houses to the end of the pueblo, after which they countermarched, and returned in the same way to their kiva. From time to time their songs broke out into shouts and gibes at the women spectators on the roofs of the houses, calling out to them to pour water on their heads. A few of the

women descended the ladders and poured ice-cold liquid over the shoulders of the dancers, which made them shiver, for they were naked and the air was biting cold.

The costuming of the *Wüwütcimtû* in their dance on this day was as follows: Hair hanging loosely over the shoulders, but with no feathers on the head; a streak of yellow ocher was daubed on each cheek, and they had bands of the same color, about the width of the palm of the hand, across the upper part of the chest, and four streaks made with their fingers parallel along the ribs; similar streaks of a finger's breadth were drawn across the upper arm, and a band, the width of the palm, decorated their forearms. There were similar broad bands around the midthigh and the calf of the leg.

On *Komoktotokya* night the author visited all the kivas, but found no exercises transpiring in them up to midnight. He was told there would be no rites in them that night, but that after the Pleiades or Orion reached the meridian all would sleep the rest of the night; he is unable to record whether or not this program was carried out, but as no altars were erected, no complicated rites are probable.

Pautiwa came into the *Moñ-kiva* about 9 P.M., and sat by the fireplace smoking in silence for a long time. He wore on his head the same two small antelope-horns which the fire-bearer wore on the evening of Assembly day, when the sacred fire was ignited; and when he left the kiva there was a loud shout by those who had assembled. His visit had a ceremonial import, but for what purpose the writer was unable to discover.

November 16—Totokya or Feast

The day called *Totokya* is one of the most important in all Hopi ceremonies, and, as a rule, is marked by the public exhibitions, whereas the previous days are devoted to secret rites in the kivas. The ceremonies performed on *Totokya* in the New-fire festival may be classed as follows: 1, Purification of all the

kivas; 2, The altar in the *Al-kiva;* 3, Ceremonies about a medicine-bowl in the *Tcivato-kiva;* 4, Public dances of the *Wüwütcimtû* society; 5, Public dance of the *Tataukyamû* society; 6, Episode of the meal beggars; 7, Feast in all the kivas; 8, Night songs in all the kivas.

1. Purification of all the Kivas

Early in the morning a man with his face whitened, carrying a small deer-horn and an ear of corn, and wearing diminutive antelope-horns on his head, visited all the kivas in turn, beginning with the *Moñ-kiva*, and carefully swept the floors, carrying the sweepings outside and casting them over the mesa side.

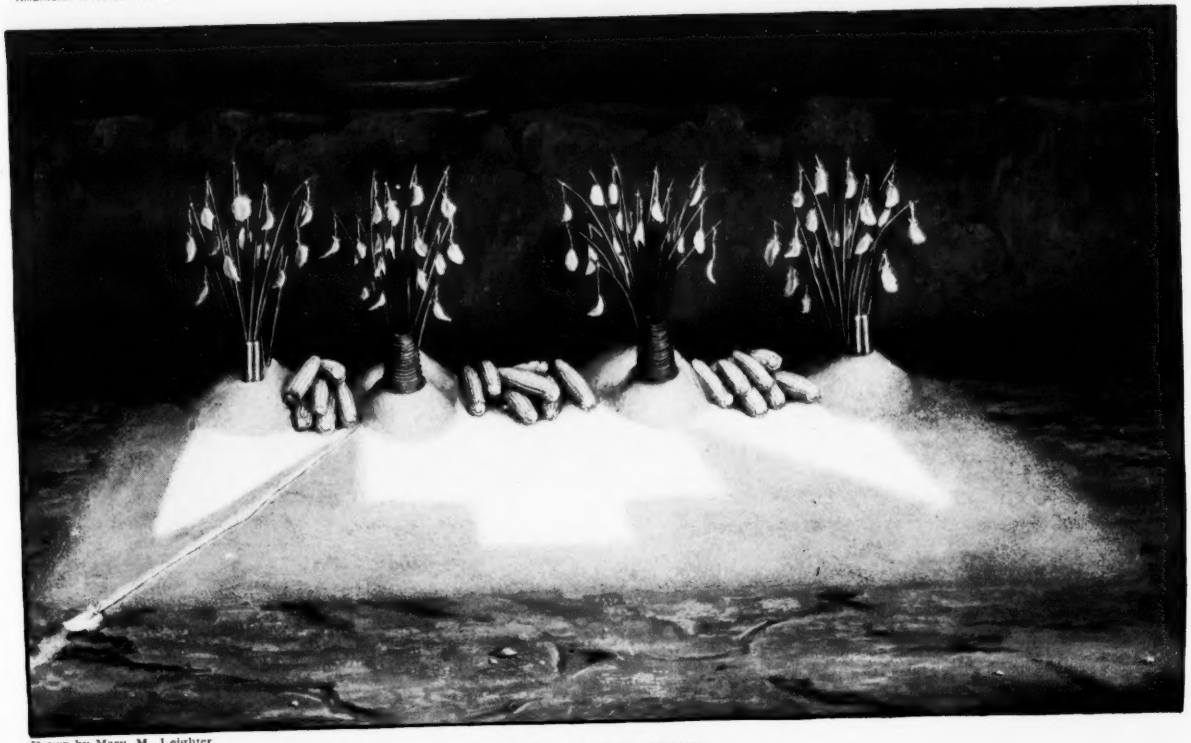
About 9:30 A.M. the *Aaltû* chiefs placed on the straw matting of their kiva hatchway, for the first time, a small basket helmet with two horns made of painted gourds,[1] and at the same hour Anawita and Tcali began the preparation of the *Kwakwantû* prayer-offerings.

2. The Altar in the Al-kiva

The *Aaltû* altar (plate V) was made in the *Al-kiva* at noon on the last day by the two chiefs, Kotka and Tuwasmi. It was of simple construction, consisting mainly of the *tiponis* of the chiefs, and four prayer-sticks which had been made earlier in the day.

A layer of valley sand was sprinkled on the kiva floor in the western end of the room, and at intervals on its western border this sand had been heaped up into four mounds at equal distances. A single prayer-stick was set in the apex of each of these mounds, and sticks with attached feathers, one for each member of the *Aaltû*, were also inserted in the top. The *tiponis* of the two chiefs were placed on the two middle mounds — Tuwasmi's *tiponi* on the right, Kotka's on the left. A string with attached feathers was stretched from the base of the latter diagonally across the

[1] This diminutive helmet was identical with those worn by novices.



Drawn by Mary M. Leighter

ALTAR OF THE ALOSAKA

floor toward the ladder. Between the mounds of sand were piled ears of corn, of many colors, tied in bundles with yucca fiber. The floor in front of the *tiponis* was covered by symbolic figures representing rain-clouds drawn with meal. There were three of these symbols, a rectangular one in the middle and a triangular one on each side. In the elaborate New-fire ceremony (*Naac-naiya*) this simple altar gives place to one more complicated, having an upright framework with symbolic figures which have not been accurately noted.

3. Ceremonies about a Medicine-bowl in the Tcivato-kiva

The songs and accompanying rites about the medicine-bowl in the *Tcivato-kiva*, on Assembly day, have already been described. They were repeated with greater elaboration on the last ceremonial day.

All of the members of the *Kwakwantû* society were present, and there were several additions to the paraphernalia of the previous celebration. The wooden plug which ordinarily closed the small hole in the floor called the *sipapû* had been removed, and a line of meal had been drawn across the floor from it to the left pole of the ladder. A second line of meal was also drawn across the floor from the medicine-bowl to the right pole of the ladder, and the bowl itself, with ears of corn, birdskins, and medicine-stones, were arranged as described in the account of this altar on the first day. On the floor of the room at the western end there were three basket-trays with meal- and prayer-offerings, and the whole western wall of the kiva was covered with helmets with curved horns, and agave stalks of many sizes, all painted white. These had been installed by Anawita in such manner as to be termed an altar (*poñya*).

All the assembled *Kwakwantû*, not excepting the chiefs about the medicine-bowl, wore their ordinary clothing, but soon after noon one of the society undressed and was painted with the

ALTAR OF THE ALOSAKA

prescribed pigments. He wore no helmet, but on his back he carried a framework covered with skin, called a moisture tablet. He put on a ceremonial kilt, and decorated his body and legs with yellow and green pigments. He made two parallel marks of these colors on each breast and shoulder-blade, and rings of yellow and green on his knees, elbows, and over his heart. This man was later a courier who was sent to *Tawapa*, or Sun spring, to bring a small netted gourd full of sacred water for the charm liquid of the medicine-bowl. A second *Kwakwantû* priest, wearing a helmet bearing large elk-horns, and clothed in a skin, accompanied the courier to the head of the stairway trail west of the pueblo. The escort left the courier at the head of the trail and returned to the *Tcivato-kiva*, but the courier hastened to the spring, returning on a run up the trail, so that in about twenty minutes he had brought the water from Sun spring to the *Kwakwantû* chief. The song and the exercises about the medicine-bowl then began and were found to be practically identical with those of Assembly day. Before the songs commenced one of the chiefs ascended the ladder, and, holding a quartz crystal in the sunlight, deflected a ray into the medicine-bowl at the western end of the kiva.

The fifth song in sequence was accompanied by the ringing of cowbells, of which the society have many and wish still more; and at the close of the sixth song fragments of a root were passed around, each priest nibbling a little, which he afterward threw into the fireplace.

Just as the songs ceased the *Tataukyamû* were heard outside the kiva singing their ribald songs, and, as the author stood on the kiva hatchway watching them pass, Pütche emerged from the room and sprinkled charm liquid upon them by dipping a feather in a medicine-bowl, which he held in his left hand, and throwing the liquid upon the dancers. He then asperged to the four cardinal points and returned to the chamber below where the *Kwakwantû* were assembled.

4. Public Dances of the Wüwütcimtû Society

The *Wüwütcimtû* society appeared in public at intervals throughout the day, emerging from the *Wikwaliobi-kiva* and forming two platoons facing each other, with a drummer between them. They were escorted by *Aaltû* priests, or *Alosakas*, two or four in number, one at each end of the platoons. The men of the *Wüwütcimtû* society clasped hands and moved with a sidelong motion, singing a song called *Me-ha-lo-lol*. Each man had his legs painted yellow, with a band of the same color above the knees. The arms, from hands to elbows, were likewise covered with yellow pigment, and there were parallel bars of the same on the chest, back, and arms.

Suñoitiwa led the two platoons, bearing a stick with attached hawk-feathers, and Katci stood between the two lines beating a drum. Each *Wüwütcimtû* wore on his forehead a flower made of pasteboard, and carried an ear of corn in one hand; all wore variegated feathers in the hair. Their dress and bodily decoration vary somewhat, but on the day called *Totokya*, when the costuming was particularly striking, it was as follows: The participants wore variegated paroquet feathers attached to the crown of their heads and their hair hung loosely over their backs; the left shoulder was painted yellow, the right, blue; a double blue and yellow line extended from each shoulder to the waist in front and on the back; the right arm had two blue lines or bands drawn along the outside over the shoulder to the elbow, and the arm from the elbow to the wrist was painted yellow, with the same colors reversed on the left arm. The right leg from a hand's breadth above the knee over that joint was colored yellow; from below the knee over the foot, blue; and a blue band the width of the thumb girt the leg above the knee. The same markings were painted on the left leg with reversed colors. Each man had a white ceremonial kilt girt with a belt, and wore a foxskin dangling from the kilt behind, with a second belt over the first. He wore a little

disk or artificial flower on his head, and carried an ear of corn in one hand. The society was escorted by members of the *Aaltû* society wearing imitation mountain-sheep helmets and bearing an ear of corn in one hand, a painted stick (plate IV, 3) in the other. This society repeated its public dances several times during the day, in the same way as in preceding presentations except that their costume and adornment were more elaborate in the closing performance than on earlier days.

5. *Public Dance of the Tataukyamû Society*

About 2 P.M., or just at the close of the rites about the medicine-bowl in the *Tcivato-kiva*, the *Tataukyamû* emerged from the *Moñ-kiva* headed by their chief, Hani (plate III). They wore only breechclouts, necklaces of rabbit-tails stained red, and ear pendants of the same objects. Their bodies were painted yellow, and their hair was tied with cornhusks in a bunch over the forehead; their faces were likewise yellow. Red bands were drawn from the eyes to the ears, and from the corners of the mouth across the cheeks. Large figures of the generative organs were painted on their chests, backs, legs, and arms, and in their hands they carried realistic representations of the human vulva made of watermelon rinds attached to the ends of short sticks.

These *Tataukyamû* were accompanied by a drummer, and were escorted by an *Aaltû* or *Alosaka* priest who wore diminutive horns on his head. The *Tataukyamû* marched in a group from place to place, holding up the imitation vulvæ (*luwa*) to the women at different houses, singing obscene songs, and making lascivious gestures and remarks. Their faces bore the expression of, and the movements of their bodies were in keeping with, their songs and remarks, while certain women replied to them in kind. Others threw foul water or urine upon the singers, which made the naked men shiver in the cold air. Their jeers were directed mainly to the women of the *Mamzrautû*, which the *Tataukyamû*

Drawn by M. Wright Gill

THE ALOSAKA MEAL BEGGARS (NUMANSISPALA)

call a sister society. Naturally very few women gathered on the housetops to listen to these remarks of the dancers.

The *Tataukyamû* first danced and sang in the court of the *Moñ-kiva* and then made their way to the houses near the "Snake rock." From there they continued past the *Al-kiva* and *Tcivato-kiva*, and then dividing into small squads visited the row of houses on the northern side of Walpi. Wherever they went they sang the same songs, calling out to the women, challenging them to come down,[1] and holding up the phallic emblems which they carried in their hands. The *Aaltû* priests acted as escorts in all these public dances, accompanying both the *Wüwütcimtû* and the *Tataukyamû* in their rounds of the pueblo.

6. *Episode of the Meal Beggars*

At the close of the public dances a pair of men from each of the *Kwakwantû*, *Aaltû*, and *Tataukyamû* societies, made a circuit of the pueblo begging for meal. Each pair wore the garb of their respective societies, were characteristically painted, and carried basket-trays. They went from house to house, silently halting at the ladders and holding up the baskets to the occupants, waiting until a woman came out and dropped a handful of meal into the receptacles, after which they continued their quest. The circuit made by these men, in their begging tour for meal, led them from their kivas eastward along the main court, then back along the less-frequented street on the northern side of the pueblo to the kivas whence they started.

The *Aaltû* beggars (plate VI) wore helmets with two *Alosaka* horns, and white buckskins, leggings, and moccasins. Their hair was loose, and the whitened artificial mountain-sheep horns were decorated with raw cotton. The bodies of the *Tataukyamû* beggars were naked, but were painted yellow, with red bands across the face from eyes to ears and from mouth to neck. One

[1] One old woman lifted her blanket and made remarks that need not be repeated.

of the beggars carried in his left hand a short stick with attached hawk-feathers, similar to the kiva standard.

The two *Kwakwantû* beggars (plate VII) were more elaborately dressed and decorated than the others. Each wore bunches of variegated feathers in his hair, and under one eye was painted a crescent in white—a characteristic marking of this priesthood. It would seem that the *Kwakwantû* very rarely wear their helmets in public or outside the kiva in the daytime. Their chests were daubed with yellow and green pigments, and there were small yellow and green rings on the middle line of the body. Similar rings appeared on the knees and calves, the former being painted green, the latter yellow, while bands of the same colors encircled the legs above the knees. The men wore white embroidered kilts tied with sashes, to which bells were fastened, and both had anklets of variegated patterns.

The distinctive object worn by these men was a rectangular framework over which was stretched a painted skin; it was bordered with plaited cornhusks to which red horsehair was attached; a bunch of variegated feathers was fastened to the upper margin, and these objects were worn on the backs of the priests. The figure painted on this skin consisted of two rectangles, one green, the other yellow, separated by a median band parallel with the longer sides. One of the men carried a short agave stalk, to the extremity of which cornhusks were fastened. In the basket in which they received the meal given by the women a prayer-stick was seen. The prayer-meal obtained by the beggars was later used in making broad trails from the kivas to the shrines in which sacred offerings were deposited.

Palahiktive

On the afternoon of the *Totokya* celebration of the New-fire in 1892 there occurred an episode of the *Tataukyamû* dance which was not witnessed in 1898. This was called the *Palahiktive*, and was the personation of the *Palahiko-mana* or Corn-maid of the

Drawn by M. Wright Gill

THE KWAKWANTŮ MEAL BEGGARS (NUMANSISPALA)

Mamzrautû, who wears the rain-cloud symbols in the form of a tablet on the head. About 3 P.M. fifteen *Tataukyamû* emerged from their kiva and danced through the pueblo, singing joyfully. Their hair was tied up in cornhusks, and their faces were smeared with bands of red pigment. Their bodies, covered with yellow ocher, were naked, and they wore ear-pendants and necklaces of red-stained rabbit-tails.[1] Several of their number were disguised as women, or wore women's blankets. These bore on their heads radiating wooden slats symbolic of feathers. One of their number wore on his head a terraced tablet, symbolic of rain-clouds, and personated *Palahiko-mana*. The five disguised men danced to a spirited song of the *Tataukyamû* for about twenty minutes, and then returned to the *Moñ-kiva*. They were accompanied by two Horn men, or *Aaltû*, as escorts.

While this was taking place the *Wüwütcimtû* society, accompanied by a drummer and four *Aaltû*, appeared and performed their eccentric dances through the pueblo. The personation of the *Palahiko-mana* is simply a complemental performance to that of the women of the *Mamzrautû*, who, in their celebration in October, represent the dances of the *Tataukyamû* and *Wüwütcimtû*, and personate the same Corn-maid.

Altar in the Tcivato-kiva

The installation of objects, as helmets, agave stalks, and elk-horns, hanging on the western wall of the kiva, is regarded as an altar, especially when the *tiponi* of the society is formally placed on its mound of sand on the floor. Counting this as one, there are two true altars in the New-fire ceremony—one, that of the *Aaltû* society in the *Al-kiva*, and the other the objects above mentioned in the *Tcivato-kiva*. The chiefs of the remaining societies, while they have a medicine-bowl placed on the floor in

[1] This is totemic. The *Tabo* or Rabbit clan lived with the *Piba* people from whom this priesthood sprung.

a prescribed way, have no true altar in either the elaborate or the abbreviated New-fire rites.

From the fact that the altar of the *Kwakwantû* consists of the objects worn or carried by them, a description of these objects separately gives the best account of their altar, and naturally falls in another place.[1]

7. *Feast in all the Kivas*

If the reader will consult the list of men who take part in the New-fire ceremony he will find in it the names of almost all the adult males of East Mesa. There was a feast in all the four kivas late in the afternoon of *Totokya*, and never has the writer seen a greater quantity of food brought to the kivas than on this occasion. Every woman in each of the three pueblos contributed something, and the amount of food thus brought together was enormous. A man stood at the kiva hatch, and as the trays of *piki*, or paper-bread, bowls of stew, and other delicacies were brought by the women, he called down to those below the name of the man to whom it belonged, and it was arranged along the middle of the room. I noticed no ceremonial pudding (*pigumi*) in this collection of food, but almost every other dish known to the Hopi was well represented. This was a most auspicious occasion to study the costumes of the women and girls, nearly every one of whom went to one or another Walpi kiva at this time. The feast began just before dusk and lasted until sunset or later.

8. *Night Songs in the Kivas*

The night of the day under discussion was almost wholly passed by the different societies, in their respective kivas, in singing their songs about their *tiponis*, all of which were set in position on the floor.[2] The nature of these rites in the different

[1] See account of helmets, *moñkohus*, and other ceremonial paraphernalia.

[2] The time for important night ceremonies in the *Tcivato-kiva*, and possibly in the others, is determined by the position of the Pleiades and Orion (*Hotumka*) which were closely watched by the natives at this time.

sacred rooms is considered in the following pages, but the account is more or less fragmentary because I was not able to see the ceremonies which were performed simultaneously in different places.

Totokya Night in the Moñ-kiva

Late in the afternoon of *Totokya*, Hani placed his *tiponi* in position just back of the *sipapû*, setting a prayer-stick just before it, and on either side ears of corn were arranged regularly on the floor. At 9:30 P.M. all the *Tataukyamû* withdrew to the spectators' part of the kiva, except the chief (Hani) and three others, who sat in the northwestern corner.

Shortly after the *Wüwütcimtû* society, headed by their chief, Suñoitiwa, and accompanied by a drummer, came in and arranged themselves in double crescentic lines facing the fireplace, with the chief on the right of the inner row. These visitors presented a song called *Me-ha-lo-lol*, accompanied by a stamping step and rhythmic motions of the body, for about ten minutes, when Suñoitiwa passed a stick with attached hawk-feathers[1] to the man at his left, saying, "*Üm yü kan yuñ i ni.*" This man, on receiving it, danced with the others once around the fireplace in a dextral[2] circuit, until he reached the end of the line, where he stood, then returned to the first position, when he passed the stick to the man at his left, and after saying, "*Akowaatni*" ("Good bye"), went up the ladder, as Suñoitiwa had done before him. This was repeated and continued until all but six of their number had left the kiva. Then the song ceased; the men of the *Wüwütcimtû* who remained greeted those in the kiva in the same way, and went up the ladder, passing on to their own kiva.

At 12:20 oclock the *Wüwütcimtû* came to the *Moñ-kiva* again, and repeated the dextral circular dance just described.

[1] A *keltsakwa*. This object is a badge of office which is used in the kiva rites and carried by the chiefs in their public dances. In this society it is identical with the *natci*.

[2] The sinistral circuit is all but universal among the Hopi.

Their bodies were naked, save for a breechclout, but they wore many beads about their necks, and artificial rosettes representing flowers on their foreheads.

On a visit made to the *Moñ-kiva* at 2:20 A.M., the *Tatau-kyamû* were heard chanting their songs, which ceased about four oclock on the next morning. These chants were remarkably solemn, with stirring measures, and altogether were very impressive. During the singing Hani sat behind his *tiponi* with his back against the kiva wall; and two *Aaltû*, wearing their horned helmets on their heads and carrying deer-antlers in their hands, stood at the ladder beating time to the songs with a movement of one leg to which a tortoise-shell was attached. They were naked save for the scanty covering of a breechcloth.

At the close of the songs an *Alosaka* brought down into the kiva two vessels of water which had been standing in the frosty air on the kiva hatch, and poured a little of it on the head of every singer. The cold water caused the singers to wince, and made a nasty wet muck on the floor.

Totokya Night in the Wikwaliobi-kiva

No special ceremonies were noted in the *Wikwaliobi-kiva* during *Totokya* night, for the frequent visits of the society to the *Moñ-kiva* left little time for rites in their own chamber. No altar was seen, and during the intervals between their exhibitions in the neighboring room most of the men were dozing on the floor wrapped in their blankets.

Totokya Night in the Al-kiva

At one oclock in the morning the *Aaltû* society were singing in their kiva around the medicine-bowl before the *poñya* or altar already described. Their medicine-bowl was placed on a low pile of sand, on which had been drawn six radiating lines representing the six cardinal directions. Kotka sat on the right, Tuwasmi on the left of this bowl, and there was a line of priests

on each side. Other rows of members sat with backs to the northern and southern walls of the kiva. The *tañalanka*, or pipe-passer, sat near the pipes on the floor west of the fireplace, and the fire-keeper (*kühitaka*) under the left ladder pole. A tyler, wrapped in a blanket, kept watch in the frosty air, on the kiva hatch, beating time with a bunch of hoops to the songs in the chamber below. Each man in the line from the medicine-bowl to the fireplace had a small rattle.

The nature of the rites in the *Al-kiva* was not determined, although visits were made from time to time to the room, and it was found that the singing was in progress throughout the night; but as simultaneous performances in the other kivas appeared to be more important, most of the writer's attention was devoted to them.[1]

Totokya Night in the Tcivato-kiva

The songs in the *Tcivato-kiva* on *Totokya* night were instructive. At about midnight Anawita, the chief, took a handful of prayer-meal from the tray and deposited it on the floor over the *sipapû*. On this he set his *tiponi*, and drew a line of meal from the latter to the left pole of the ladder, after which he took his seat just behind the *tiponi*. The whole western end of the room was filled with *Kwakwantû* helmets, horns of deer, and other paraphernalia, forming, as Anawita said, a true *poñya* or altar. At Anawita's right sat Nasimoki, and the *Kwakwantû* members were disposed in an irregular circle, leaning against the northern and southern walls of the room.

Basket-trays, with sacred meal and *nakwakwoci*, were placed

[1] It is quite impossible for a single student to adequately witness in one presentation all the events of any of the great ceremonies of the Hopi. On *Totokya* night of the New-fire ceremony rites were being performed in three different rooms at the same time. The writer patrolled from one kiva to another, passing into the superheated rooms again and again throughout the night. The outside air was bitterly cold and the passage from one kiva to another on the mesa summit is often dangerous on account of the darkness. Some of the rites consequently may not have been observed on account of the impossibility of witnessing all the features at once.

on the floor on each side of the *tiponi*, and the medicine-bowl was near by. The asperger sat near the bowl, and in front of him there were several wooden slats, each representing the Great Snake. The pipe-lighter sat near the fireplace, and the man who tended the fire squatted under the ladder. A song score was kept by the pipe-lighter with kernels of corn, and each member of the society had an ear of corn tied to his breast by a string or piece of cloth. Many carried wooden slats in their hands, and each had a white crescent painted under the left eye.

At half-past one oclock the tyler took his station on the kiva hatch, and the asperger, dipping the aspergill in the medicine, asperged to the cardinal points. Anawita and Nasimoki began a song, in a very low tone, accompanied by the others ringing copper bells. Each man held in one hand his wooden effigy of the Great Snake.

The medicine-bowl had been placed directly on the stones of the floor, not on the sand, and there were no meal lines below it and no ears of corn or birdskins arranged radially about it as in former celebrations. The songs were intended to consecrate the prayer-sticks which were placed in basket-trays on the floor. These songs never rise above a low murmur, and only the chief sings—the remaining priests beat time to the song.

In the fourth song Anawita rapped on the floor with his agave rod to which cornhusks were tied ; and the fifth song was a rapid quickstep in which the din of the cowbells was almost deafening. During the sixth song the medicine-bowl was raised a few inches from the floor, and every priest beat violent time as the song progressed. The seventh and eighth songs were also accompanied by violent rapping on the floor and long-continued clanking of the cowbells.

At the close of the songs all the priests, one after another, stepped to the *tiponi*, sprinkled it with meal, and threw a pinch of the same along the floor toward the ladder. The chief then prayed, after which the pipe-lighter passed the pipe to him, and

at about three oclock in the following morning the exercises were concluded with a formal smoke, when the two *Alosaka* men came to get their prayer-offerings.

November 17—Tihuni or Pigumnovi

The fifth day of the New-fire ceremony, in its abbreviated presentation, is called *Tihuni*, and as one of several purificatory rites occurs on that day it is also called *Navotciwa*.

The events of the fifth day may be considered under two headings: 1, Visits of six youths with prayer-offerings to the shrines of *Talatumsi* and the spring called *Tawapa;* 2, Disposal of the embers of the sacred fire.

At the earliest light, on the fifth morning, a few *Tataukyamû* priests sprinkled broad trails of meal from the *Wikwaliobi-kiva* through the passageway to the *Tcubmo*, then across it to the *Al-kiva* and the neighboring *Tcivato-kiva*, and back to the *Moñ-kiva*, casting what was left into a tray upon the hatchway, after which all descended into the room.

On this morning everyone, man and woman alike, washed his head with amole, and many of the mothers performed the same for their children. It is customary for all participants in ceremonies to practice this form of bodily purification before rites begin, but its universality in the New-fire rites is noteworthy, for those who had taken no active part in the rites observed it as well as the participants. An explanation of this general and widespread performance of head-washing at this time may be that almost every adult male on the East Mesa belongs to one of the four societies which combine in the celebration of this fire ceremony, and the families of all are directly interested inasmuch as all women brought food to the kivas.

1. Departure of Six Youths with Prayer-offerings

Early in the morning six young men of the *Aaltû* society, wearing their typical costume, took all the *nakwakwoci* from their

own kiva and went in pairs to all the other kivas where they were given like prayer objects of the other societies. They received also a considerable quantity of prayer-meal and went off sprinkling the meal along the trails as they departed.

Two of these men went to *Tawapa*, two to the shrine of *Talatumsi*, and two to *Hopakpahoki*, the shrine where the image of *Talatumsi* was formerly kept, but from which it was removed on account of the inroads of hostiles.[1] The trails which these couriers made with meal were so plain that their course could readily be followed, and from them it was possible to discover the shrine in which the image of *Talatumsi* rests. This shrine is a built-up nook in an angle between two large bowlders, on the lower terrace of the mesa about opposite the upper stairway trail, on its southwestern point. A rough wall encloses the front of this shrine, from which two stones can be removed. The image sits within the shrine, costumed in a white ceremonial blanket with a girdle in which are two or more prayer-sticks. In the abbreviated New-fire rites two *Alosaka* priests are said to carry offerings to her, but at *Naacnaiya* she is carried into Walpi by Kakapti and set on the kiva roofs where interesting rites are performed about her.

2. *Disposal of the Embers of the New Fire*

The most important ceremony on the last day of the New-fire rites was the purification of the participants and the disposal of the ashes of the new fire from the fireplaces of the kivas. The latter event, which is also a purificatory rite, occurred at early dawn, and each society disposed of the embers from its own kiva in its own way. As has been shown, the flame of the new fire cannot be profaned by lighting cigarettes or by other secular uses, so the ashes must be treated in a reverential manner. They

[1] This last-mentioned shrine is just beyond the Apache and Ute pictographs above the wagon trail to *Wala*, about seventy-five yards west of the count incised on the cliff giving the number of the slain in the last invasion of these nomads.

are therefore disposed of in a ceremonial way befitting the regard in which they are held.

The first society to perform this rite was the *Kwakwantû*, each member of which took a fragment of watermelon rind and scooped into it, out of the fireplace, a quantity of embers and ashes, dividing them into about equal proportions among the members. Special care was taken that all the ashes were removed from the fireplace. Each man then took a handful of sacred meal and, led by Anawita,—Hayi closing the procession,—they all filed up the ladder of the kiva, marched through the plaza under the covered way leading northwestward from the "Snake rock," and then along the alley to the cliff at the western end of Walpi overlooking the site of the old pueblo. There they stood in line facing the west, each man holding the melon rind in his right, and the meal in his left hand. He first cast a little meal on the ashes, then waved his left hand in sinistral circuit over his head four times, and cast the remainder of the meal toward the west. They next threw the melon rinds with the enclosed ashes over the cliff and returned to their houses. These movements were observed almost simultaneously by all members of the society.

The other three societies disposed of the embers of the fire in their kiva in much the same way as the *Kwakwantû*, but went to a different part of the mesa for that purpose. They came out of their kivas bearing in their right hands melon rinds containing the embers of the fire, and filed through Walpi along the main thoroughfare toward Sitcomovi. Passing this pueblo they continued to the western edge of the mesa, each society huddled together apart from the others. The *Aaltû* were more isolated than the other societies, which were together. The manner of performing the purifications was almost identical in all the societies and it took place at about the same time.

The *Kwakwantû* address their purification to the *katcinas* of the Salt cave of the Grand canyon where there are stalactites (*lepena*) believed to be connected in some occult way with the

horns of their helmets. The other societies address themselves to a point near the junction of San Juan and Colorado rivers. All the societies were without ceremonial costumes, but had common blankets wrapped about them. There is much mysticism in the proceedings which thus far the writer fails to understand.

Explanations of many rites are offered by priests, but as there are no means of deciding whether they are ancient and traditional or simply modern and personal, they are not here recorded. In many instances these native explanations in which much esoterism appears to enter, have not been understood; and in some cases it appears evident that the man who gave them was inventing what seemed to him to be a satisfactory solution.

The *Tataukyamû* threw over the cliff with the ashes from their kiva the imitation vulvæ made of watermelon rind, the cornhusks in which their hair had been bound, and the rabbit-tail ear-pendants. The *Wüwütcimtû* cast over the cliff with the ashes from their fireplace the pasteboard flowers which they wore on their foreheads during the last days of the ceremony.

After disposing of the ashes of the new fire, all the priests vomited over the cliffs, as in the last day of the Snake dance, and then returned to their kivas where other purification rites were performed.[1]

Four Days Following the Purification

Four nights after the close of the *Wüwütcimti* the chiefs slept in their kivas, and the helmets and other paraphernalia of the *Kwakwantû* remained hanging on the kiva wall. This is believed to be an indication of the connection of the abbreviated ceremonial with the elaborate *Naacnaiya*. The latter presentation has nine days of active ceremonies, while there are but five in the *Wüwütcimti*, without counting the four above mentioned; but if

[1] A simple form of purification consists of taking a little meal or ashes in the left hand, waving it with a circular pass over the head, and throwing it out of the kiva hatch.

these were added to the five, we would have a nine days' ceremony in the abbreviated variant. To this may also be added the days preceding the Assembly and following the Smoke-talk which in the *Wüwütcimti* number five; but the number between the Smoke assemblage and the Assembly (*Yuñya*) in the *Naacnaiya* has yet to be determined.

New-fire Rabbit-hunts

For several days after the close of the festival elaborate rabbit-hunts were organized by the different societies which took part in the New-fire ceremonies. Each society had its own hunt, which occurred on its own day, and the game obtained was eaten in the kiva occupied by the society during the festival.

Comparisons of the Elaborated and the Abbreviated New-fire Ceremonies[1]

The elaborated New-fire ceremony is made much more complicated than the *Wüwütcimti* by the element of initiation of novices, which gives it the name *Naacnaiya*. It is likewise a nine days' ceremony, instead of one of five days, the episodes of which appear in the following list:

Yuñya, Assembly: 1, Six-directions altars in the *Moñ-kiva*, *Al-kiva*, and *Tcivato-kiva*, and accompanying making of charm liquid or medicine. 2, Making of the new fire in the *Moñ-kiva*. 3, Figurine of *Talatumsi* brought into the pueblo from her shrine. 4, Initiation exercises in the *Moñ-kiva*. 5, Initiation exercises in the *Tcivato-kiva*.

Custala: 1, Figurine of *Talatumsi* carried to kiva hatch of *Tcivato-kiva*. 2, Patrols of the *Kwakwantû* and *Aaltû*. 3, Novices visit shrines. 4, Making and smoking of the snow pipe.

Luctala: 1, *Tataukyamû* dance with *keles*. 2, Boys dressed as women. 3, *Pahos* made.

Paistala: 1, Trails closed; no living being allowed to enter the pueblo. 2, Novices carried to Custupuntukwi (Moki butte). 3, Altar constructed in *Al-kiva*. 4, Smoking of the snow pipe. 5, Patrols of the *Aaltû* and *Kwakwantû;* visits to the shrines, and sprinkling of *Talatumsi*.

[1] For an account of these rites see *Jour. American Folk-lore*, 1892, pp. 189–220.

Naluctala : 1, Sprinkling of the figurine of *Talatumsi* and accompanying songs. 2, Return of *Talatumsi* to her shrine. 3, Dance of the *Tataukyamû*. 4, Dance of the *Wüwütcimtû*.

Yuñya : 1, Dance of the *Wüwütcimtû*. 2, Hunts by the different societies.

Cuskahimû : 1, Dance of the *Wüwütcimtû*. 2, Dance of *Aaltû* and *Tataukyamû*, and of *Kwakwantû*, *Aaltû*, and *Tataukyamû*. 3, Beggars ask for meal. 4, Initiation ceremonies in *Tcivato-kiva*.

Komoktotokya : 1, Songs of the *Kwakwantû* and processions. 2, Public dance of the *Wüwütcimtû*. 3, Public dance of the *Tataukyamû*.

Totokya : 1, Dance of the *Wüwütcimtû*. 2, Dance of the *Tataukyamû*. 3, Leaping of priests over fire. 4, Lines of meal made in plaza. 5, Procession of the *Kwakwantû*.

Aside from the complicated rites connected with the initiations, one of the most important events in the New-fire ceremony called *Naacnaiya* is the bringing into the pueblo of the image of the Dawn-woman, *Talatumsi*, which occurs on the first day.

Directly after the new fire had been kindled in the *Moñ-kiva* in the *Naacnaiya*, " Kakapti, a member of the Horn society, appeared at the head of the stairway (south) trail, on the edge of the court in which the *Moñ-kiva* is situated. He wore the typical helmet of the *Aaltû*, a large white Havasupai buckskin thrown over his shoulders as a mantle, and a large clanking tortoise rattle on each leg fastened behind at the garters. He crossed the court bearing *Talatumsi* (Dawn-woman), a wooden figurine, eighteen inches high, arrayed in the miniature white mantle and girdle which had been observed in the *Al-kiva* on that morning. Thrust in her girdle were the two sets of *pahos* also noted in the same place. Kakapti held a deer antler in his left hand, and carried in both hands before him the figure as if in a tray. He approached at a very reverential pace, and placed the figurine, facing westward, on the eastern front of the *Moñ-kiva* hatchway where the *natci* stood." On the morning of the next day the figurine of *Talatumsi* was set on the kiva hatchway of the *Tcivato-kiva*, and there it remained until the morning of the fifth day,

when it was returned to its shrine among the rocks by Kakapti, escorted by the four societies, especially the *Aaltû*.

The sacred character of the New-fire rites, in their elaborate form, may be seen from the fact that the trails to the pueblos are "closed" by drawing a line of meal across them. In former times, it is said, this tabu was very strict, and anyone who ventured to cross the lines of meal was killed. The symbolic closing of the trails is not observed in the abbreviated New-fire rites.[1]

The smoking of the great snow pipe is omitted in the abbreviated ceremony. This pipe, the capacity of which was at least four ounces of tobacco, was manufactured by the *Kwakwantû* from clay, and was baked by women members of the clan to which this society is related.

The altar of the *Aaltû* society, in the *Naacnaiya*, is much more complicated than that made in the abbreviated rites, but unfortunately the author has been unable to make a sketch or photograph of this more complicated form. Although we have a fairly complete account of *Naacnaiya* in the article above quoted, there still remain many obscure points which need elucidation, and it is particularly desirable that exhaustive studies of the ceremony be made at Walpi and the other Hopi pueblos.

Social Organization of the Four Religious Societies which Participate in the New-fire Ceremony

It is of great importance, in all studies of Pueblo ceremonies, to gain accurate knowledge of the relationship of the religious society to the clan. Among the Hopi this knowledge is the key to the history of the ritual. Certain phratries or clans, according to legends, brought to Walpi certain religious societies, and the rites characteristic of those societies are best understood when we know where those clans lived before they joined Walpi and to what other Pueblo stocks they are kin. This connection of

[1] When a line of meal is drawn along the trail, as it is in all great ceremonies, the trail is opened, but when across the trail it is closed.

clan and religious society is intimate, and although difficult to trace in all its significance, it cannot be overlooked in the study of the New-fire ceremony, and therefore merits special consideration. In the following pages will be given the names of the different members of these societies and the clans to which they belonged, followed by a discussion of the legendary derivation of the societies.

The following lists give the names of all members of the different societies who participated in the New-fire ceremony at Walpi. They are arranged under their respective clans, and it will be seen that they come from all three pueblos[1] on the East Mesa, and practically include the whole adult male population.

Members of the Wüwütcimtû

Asa clan: Suñoitiwa (chief), Kükütc, Tuwakükü, Amitola, Hayo, Mae, Hola, 7. *Tcüa clan:* Kopeli, Moume, Sikyahoniwa, Sanna, "Pinto," Navawinu, 6. *Tuwa clan:* Sikyahonau, Pavatiya, Kaventima, 3. *Pakab clan:* Potca, 1. *Tawa clan:* Sikyapiki, 1. *Piba clan:* Homovi, 1. *Patki clan:* Tcüa, Tukpa, Makiwû, 3. *Kokop clan:* Kunauhia, Katci, Maho, 3. *Katcina clan:* Naka, Talawiñuh, 2. *Ala clan:* Sikyaventima, Hoyamtiwa, 2. *Tabo clan:* Tcaine, Tu'tci, 2. *Honani clan:* Süta, 1. *Honau clan:* Lelo, 1. SUMMARY: *Asa* (chief), 7; *Tcüa*, 6; *Tuwa, Patki, Kokop*, 3; *Katcina, Ala, Tabo*, 2; *Pakab, Tawa, Honau, Honani, Piba*, 1.

Members of the Tataukyamû

Piba clan: Hani (chief), Namoki, Siskyamû, Naatiwa, Masahoniwa, Papu, 6. *Honani clan:* Ami, Hezi, Moñwû, Hozeu, 4. *Ala clan:* Sokoni, Sühimû, Pakabi, Nakto, Tcona, 5. *Kokop clan:* Mau, Leso, Nae, Sami, 4. *Leñya clan:* Tcizohoya, Turnoa, Sami, 3. *Patki clan:* Supela, Kwazru, Nanaha, 3. *Honau clan:* Nakwaümû, Tawa, Nato, 3. *Tcüa clan:* Wiki, Koyawaiamû, 2. *Pakab clan:* Nae, Piba, 2. *Katcina clan:* Tasi, Siventiwa, 2. *Kükütc clan:* Sükti, 1. *Asa clan:* Wacri, Turkia, 2. *Tuwa clan:* Tcaka, 1. SUMMARY: *Piba* (chief), 6; *Ala*, 5; *Honani, Kokop*, 4; *Leñya, Patki, Honau*, 3; *Tcüa, Pakab, Katcina, Asa*, 2; *Kükutc, Tuwa*, 1.

[1] There is no celebration of the New-fire ceremony at Sitcomovi and Hano.

Members of the Aaltû

Asa clan: Tuwasmi (chief), Murna, Talahoya, Hauta, Sikyatala, Nuvati, Chiaswzru, 7. *Honani clan:* Turni, Yoyowaia, Tcokcti, Yakwa, Yoyowaia, Soya, Apa, 7. *Tuwa clan:* Sania, Takala, Matco, Kakapti, Matchwuñ, Talanainiwa, 6. *Honau clan:* Kotka (chief), 1. *Ke clan:* Ikwioma, Tobi, 2. *Patki clan:* Tcasra, Pocto, Kwatcakwa, Tcino (Tcoshoniwû), Wiwila, 5. *Tabo clan:* Talasi, Honauuh, Lele, Letcomo, 4. *Leñya clan:* Hayi, 1. *Katcina clan:* Kükü, Tawaianmû, 2. *Kokop clan:* Sikyane, Koitchwinûh, 2. *Ala clan:* Pontima, Pehma, 2. *Tcüa clan:* Hoñyi, Lomovoya, 2. SUMMARY: *Asa* (chief), 7; *Honani*, 7; *Tuwa*, 6; *Patki*, 5; *Tabo*, 4; *Katcina, Kokop, Ala, Tcüa, Ke*, 2; *Honau, Leñya*, 1.

Members of the Kwakwantû

Patki clans: Anawita, Nasimoki, Kwaa, Nakala, Vehti, Poyi, Klee, Klee, Paca, Kela, Sakwistiwa, Citaimû, Suñe, 13. *Tabo clan:* Potkone, Uryi, 2. *Kükütc clan:* Tubeñiya, 1. *Ala clan:* Pütche, 1. *Leñya clan:* Turkwi, Mohti, Nitioma, 3. *Honani clan:* Cikuli, Totc, (Zuñi), Nanakoci, 3. *Asa clan:* Pehley, Añwuci, Lomaiisba, Turkwenuñ, 4. *Tawa clan:* Naminhu, 1. *Tcüa clan:* Nuvawiñû, Alosaka, Wikyatiwa, Tenutci, 4. *Katcina clan:* Avaiyo, 1. *Piba clan:* Tcali, Letaiyo, 2. *Kae clan* (*Kolon-towa*): Kanu, 1. SUMMARY: *Patki* (chief), 13; *Asa, Tcüa*, 4; *Honani, Leñya*, 3; *Tabo, Piba*, 2; *Kükütc, Ala, Tawa, Katcina, Kolon* (of Hano), 1.

THE WÜWÜTCIMTÛ SOCIETY

The *Wüwütcimtû* society is said to have been introduced into Tusayan by the *Patuñ* or Squash phratry, to which the predecessor[1] of the present chief belonged. The clan is now extinct at Walpi, and consequently is not represented in the list of members of the society.[2] According to several traditions there were *Patuñ* or Squash clans at Awatobi, and as the chieftaincy of the *Wüwütcimtû* was formerly held by a member of this clan it may be that the society was introduced from Awatobi pueblo, just as the

[1] At his death the Squash clan in Walpi became extinct, and the office of chief was transmitted to his son. This is irregular, for the chieftaincy of any Hopi society is always retained in the same clan, so that it falls either to a brother or a nephew.

[2] *Asa* men predominate in the present membership. See the list.

Piba or Tobacco clan is supposed to have brought the *Tataukyamû* from the same pueblo. Before they came to Tusayan the *Patuñ* clans lived in certain pueblos, now in ruins, along the Colorado river. They first settled in Tusayan, on the Middle Mesa, at a place called Tcukubi, where the ruins of a pueblo of some size may still be seen. The *Atoko* (Crane), and *Kele* (Hawk) clans are also said to have lived with the Squash people at that place, and it is highly probable that they migrated from the south together,[1] entering the Hopi country at about the same time. Like the Squash, the Crane and the Hawk are now extinct at Walpi, but several of the Crane people lived in Walpi and Sitcomovi within the memory of the oldest inhabitant.

It would appear that the cultus ancestral personages of the *Wüwütcimtû* and *Tataukyamû*, whose sister was of the same clan, were descended from Taiowa in the Underworld. Provisionally we may believe that they belonged to the Squash or "Sorrow-making" phratry, as that phratry brought these societies to Tusayan. Taiowa[2] invented the flute and made the first altars and fetishes. In his visit to the Underworld he met a maid, and drew her toward him (Orpheus-like) by means of this flute. He took her to his house in the Underworld, and she bore him sons and daughters. To one of his sons[3] he gave the mysteries of the *Wüwütcimtû*, and taught one of his daughters the secret rites of the *Mamzrautû*, for which reason these two societies, in a sacerdotal sense, are brothers and sisters.

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[1] Some good authorities say the Squash clans came from the north.

[2] Some say Taiowa is a solar god, which harmonizes with the above legend, for the Sun is father of all cultus heroes. The sun emblem plays an important part in the great ceremony (Flute) in which the flute is used. Some Hopi say the Squash or "Sorrow-making" phratry introduced the *Macileñya* society, one of which bears the sun shield in Micoñinovi, and it is a significant fact that both this society and the Squash clan, which are said to have introduced it, are extinct at Walpi.

[3] Perhaps two legends are inextricably mixed in the above account, for neither is the flute used in the New-fire ceremony, nor does a representation of the Flower-mound appear in the kiva exercises in that rite. In the Flute ceremony the mound with artificial flowers is made in the kiva, and the idols of the Flute-youth and Flute-maid sit before them.

The altars were erected in the Underworld by the son and daughter some distance apart before the *Atkya Sitcomovi*, "Flower-mound of the Underworld," on which sat the God of Germs. Then the youth called out to his sister, "*I civaiya ümi nükuc mana*" ("My sister, you are a nasty maid)." She replied in kind, and after many gibes and jeers they closed by pouring water upon each other, in jest, "and thus, we hope," the narrator said, "the rain may water our fields."[1] The Squash clans to which the youth and maid belonged are also called *Tubic*, or Sorrow people, possibly from this interchange of rude jests, which is called *tubic-latoto*, "sorrow-making." Muiyinwû, the Germ god, they claim, gave to the boy and his sister the seeds of the corn, melon, squash, and bean, and was probably their mother.

The above legend presents a plausible explanation why it is that throughout the New-fire ceremonies phallic rites are especially prominent, and why ribald remarks of the *Wüwütcimtû* are especially directed to the women of the *Mamzrautû* society. The clans from which these two societies spring were formerly the same or near akin.

The *Wüwütcimtû* have on their cheeks the zigzag marks which are characteristic of the *Hehea-katcina*, and during the New-fire rites they wear on their foreheads rosettes made in imitation of flowers. We find a similar artificial flower worn by personators of the *Hehea-katcina* in the *Powamû* ceremony at Walpi; and in the burlesques of the *Wüwütcimtû* by the women in their ceremony called *Mamzrauti*, zigzag markings are painted on their cheeks to denote *Hehea-katcinas*. These facts indicate an intimate connection between the *Wüwütcimtû* and the *Hehea-katcinas*.

It may be interesting here to note several so-called shell masks obtained from Tennessee by Professor Putnam, and others from Virginia described by Mr Carr,[2] which have zigzag lines

[1] The key to all ceremonies is embodied here. The priest imitates the natural processes he wishes to bring to pass, or shows the god what he wishes him to do.

[2] *Tenth Annual Report of the Peabody Museum.*

under the eyes like the Hopi *Hehea-katcinas*. The Hopi priests, to whom copies of the figures of these objects were shown, identified them as masks of *Hehea*, so close was the symbolism. It has been suggested that the zigzag lines on the Tennessee shell masks represent tears, on the supposition that they were mortuary; but this explanation is not accepted by the Hopi priests, although they have given no lucid explanation of the meaning of the zigzag symbols. In a doll of the Zuñi *Hehea* they are replaced by parallel lines, which are also found on an effigy vase from a cave in the Nantacks elsewhere described.

The Tataukyamû Society

Hani, chief of the *Tataukyamû* society, is also chief of the *Piba* clan, and claims that the society was introduced into Walpi by his ancestors.[1] He says that Tapolo, who admitted the hostiles into Awatobi on the night that pueblo was destroyed, was chief of the *Piba* clan and of the *Tataukyamû* priesthood, and that he is Tapolo's direct descendant.

The home of the *Piba-Tabo* clans before they went to Awatobi is fairly well known, for legends state that they formerly lived with the *Patki* and Squash clans in now-ruined pueblos along Little Colorado river. Near where Chevlon fork flows into the Little Colorado, on its left bank, there is a ruin called by the Hopi Cakwabaiyaki, "Blue-running-water pueblo." This place is often visited by the Hopi, and from the Chevlon they procure water to use in some of their ceremonies. A doll representing a *Tataukyamû* priest was identified for me as one of the *cakwabaiyakyamû*, or priests from Cakwabaiyaki; and as the *Piba* clans are said to have brought the *Tataukyamû* to Tusayan from the pueblo on the Little Colorado south of Walpi, it is reasonable to conclude that this pueblo was that now in ruins on the Chevlon. In the

[1] *Piba* men now predominate in this society. See the preceding list.

Piba-Tabo clans we find a *Tawa* or Sun clan, and possibly the name *Tataukyamû*[1] refers to that clan.

Like the *Wüwütcimtû*, the public dances of this society during the New-fire festival have a phallic import, which is suggested in the decoration (?) of the bodies of its members with phallic emblems, their bawdy gestures, and the objects which they carry in their hands. Their remarks are especially directed to the women of the *Mamzrautû* society which, like the *Tataukyamû*, was formerly represented in Awatobi. Their coarse ribaldry, obscene gestures, and drenching with foul liquid are simply repetitions of what legends say took place in the Underworld, as mentioned elsewhere when the youth and his sister quarreled before the altar of the Germ god.

A complemental portion of this ceremony when the *Tataukyamû* jeer at the women and greet them with obscenity, is thus described in the writer's account of the *Mamzrauti:* On the eighth day, "before sunset, twenty-one persons, nearly all young women and girls, came down into the kiva, wearing nothing but their oldest and shabbiest tunic gowns and girdles. They rubbed their bodies with mud, in the eastern corner of the kiva, as on former evenings, and then decorated themselves by tying their hair up with cornhusks and plumes in a cone over the forehead. They adorned themselves with rabbit-skin tufts for eardrops and necklaces, and painted red (*cuta*) across the face. Each took an ear of corn and one took a drum.[2]

"Having thus arrayed themselves they made an entire circuit of the village, imitating the *Tataukyamû*, singing, and pointing the ears of corn in a sarcastic fashion to the men, who came to the edge of the house terraces as did women of the *Mamzrautû* in the New-fire ceremony. They sang many jesting songs, in which they pretended great anger and denounced the men as

[1] On account of the similarity of the words *tawa*, "sun," and *tawalû*, "to sing," the derivation of *tatau-kyamû* is not clear.

[2] Compare this costuming with that of the *Tataukyamû* on *Totokya*, the final day of the New-fire ceremony.

being lazy and worthless, declaring they had come to kill them as the Apache used to do. Some of the other songs, as the snow chant (*Nuvaiwinu*) and certain moisture chants were very pleasing melodies.

"The men pretended to be angry, and poured water on the women, throwing it promiscuously, as a general thing, but in many instances particular young women were singled out, chased, and douched, and thus from home to home the women continued their serenade. About half of the jars emptied on them contained urine, most of which had been standing long enough to partially decompose, and the stench in the courts was almost overpowering, although a high wind was blowing. Half a dozen of the young women were chased by the men (no women threw any liquid or took part except the celebrants), and these were either thrown down (not violently) or laid down, when overtaken, and when about a dozen men had surrounded one woman, they rubbed filth in her hair, on her face, and over the upper part of her bosom and neck. They raked this filth with their fingers from the moist alley corners, and in one instance, at least, a man was seen to rub a girl with ordure. A crowd followed the singers and keenly enjoyed the foul fun. Completing the circuit of the village, on reaching the *Al-kiva* they darted down and laid their ears of corn on the altar, but all the young women ran home, changed their drenched gowns, and rinsed their hair. The elder women neither washed nor changed their clothes, but simply laughed and remarked upon the awful stench, saying it would soon 'pass."

Thus do the women of the *Mamzrautû* and the men of the *Tataukyamû* dramatize the frolics which the son and daughter, children of Taiowa, cultus hero and heroine of the two societies, performed in the Underworld before the altar to Muiyinwû, the mother of both societies.

Similar episodes in which *Mamzrauti* personations figure occur also in a *katcina* called the *Powamû*. Thus, on one of the

last days of this ceremony at Walpi, while the personators called *Natackas* are going the rounds of the pueblo, there emerged from the *Al-kiva* six men arrayed and costumed as the *tcatumakaa* of the *Mamzrauti* dance, who, singing as they went, marched to the dance court and halted near the edge of the cliff, facing the houses. The *Natacka* group accompanied them, and two men personifying *Hehea-katcinas* assumed erotic paroxysms and lay down on their backs on the ground close to the disguised *Mamzrauti* personages, endeavoring to lift up their kilts, and performing obscene actions. Then they rolled on the ground in assumed fits. . . . After about five minutes of this exhibition the *Hehea* seized the *Mamzrauti* personators and tumbled them into an indiscriminate heap, fell on top of them and did other acts which need not be described.

The reader's attention is called to the fact that here we have the *Wüwütcimtû* represented by *Hehea-katcinas*, the symbolic marks of which they paint on their faces in the New-fire ceremony. These *Hehea-katcinas* treat the *Mamzrau* personators much as the *Wüwütcimtû* do the same in the public dances in the New-fire ceremony.

There is a public dance at sunset of the last day of the *Mamzrauti* which is called *Palahiktiva* from the fact that *Palahikomana* is personated, which corresponds with the exhibition of the *Tataukyamû* on the fifth day of the New-fire ceremony. About thirty participants celebrated this dance, and they dressed themselves for the representation in their kiva. They first daubed their feet, arms, and necks with muddy sand, and fastened their hair with cornhusks in a mass on the crowns of their heads. Preceded by a drummer they went to the eastern end of the plaza, at the edge of the cliff. Before them danced four maids costumed alike. They wore on their heads a tablet fastened vertically by a string passing under the chin. Their hair was hanging loosely down their backs, their faces were coated with white meal, and a string of turquoise beads hung from each ear lobe;

a white blanket girt with a belt covered the body, and in each hand they held, about vertically, two eagle-tail feathers. These girls represented the *Palahiko-mana*,[1] but are not personated in the *Mamzrauti* at every presentation.

In the presentation of the *Mamzrauti*, at Walpi, in 1893, there was a modification in the symbolism of the actors who address these jeering songs to the men. This episode is called the "Kohonino" (Havasupai) dance and is supposed to have been derived from this people inhabiting Cataract canyon.

Among the dolls frequently offered for sale at Walpi there is one called the "Kohonino *katcina*," which is a close imitation of the symbolism of the women in the dance referred to, so that its designation as a *katcina* refers more to its general supernal nature than to its sex.

Two days after the dance of the *Palahiko-mana*, in the celebration of the *Mamzrauti* in 1893, this Kohonino dance was performed in the courts of Walpi. There were three groups of participants: (1) Five maids with yucca fillets bound on their foreheads; (2) Six maids wearing two lateral horns on the head, attached to a band; (3) A group of women, one of whom had a drum, serving as the chorus.

The first group wore an ordinary dark blue blanket, but no mantle, although many had a piece of calico over the shoulder. Their faces were rubbed with meal, and across the nose and cheeks was drawn a curved line by means of the finger tips dipped in moistened shale. They wore many necklaces and in their ears strings of turquoise. All were barefoot and faced the chorus or third group. In their right hands they carried gourd rattles, and ears of maize and strings of fancy bread in the left. The bread and other food they later gave to the spectators, generally men or boys.

[1] The symbolism of *Calako-mana* is so close to that of *Palahiko-mana* that they are regarded as practically identical personages. Sometimes instead of being personated by girls they are represented by a picture on a wooden tablet.

The second group, composed of six young women, wore on their heads a fillet made of willow wrapped with strips of red, green, and white cloth. To the front of this fillet, over the forehead, were tied several downy feathers from the eagle's body. To the back of the fillet was attached a bunch of paroquet feathers and several vertical radiating parrot tail-feathers. On each side of the fillet there projected a horn made of a flat slab of wood striped in different colors, either painted or bound in strips of colored cloth. The face of each woman was covered with meal and a bright vermilion spot appeared on each cheek. She wore a *kwaca* and an *atüü*[1] blanket and had moccasins on the feet. In her hands each woman of the second group carried a Havasupai basket which she held as do the Hopi women in the *Lalakoñti* dance. The women of the second group alternated in line with those of the first, and during the songs they moved their baskets in cadence with the songs.

The third or largest group of women in this Kohonino dance surrounded one of their number, the drummer, and sang various stirring songs. They introduced in their songs names of prominent men, calling them gluttons, filthy, lecherous, accusing them of many crimes and peccadillos. They satirized, however, only members of the *Wüwütcimtû* and *Tataukyamû* societies, for they stand in awe of the *Kwakwantû*[2] and the *Alosaka* or *Aaltû*.

The Aaltû Society

There is great obscurity regarding the clans which introduced the *Aaltû* society into Walpi, and statements of different traditionists on this point are not easily harmonized. The *Aaltû* are also called the *Alosaka*, whom they personate in wearing the imitation horns of the mountain sheep. The relationship of the *Alosaka* cult to the Hopi ritual has elsewhere been discussed and

[1] *Kwaca*, the ordinary dark blue blanket; *atüü*, white with red or green borders.

[2] Sacerdotally the *Kwakwantû* and *Lalakoñtû* societies call themselves brothers and sisters, which probably means that they were both evolved from the same clans, the Rain-cloud or *Patki*.

the conclusion reached that this cult was introduced by the Squash people from southern Arizona; but it will be seen that the *Asa* and *Honani* clans, both of which came from the Rio Grande pueblos, are prominently represented in this society. It would seem perfectly natural to associate the *Aaltû* or Horn men with the *Ala* or Horn clans, especially as *Pañwu*, the Mountain sheep, is often relegated to these clans. The *Aaltû*, however, associate with societies which have no connection with the *Ala* clans.

There is good evidence of a personification of *Alosaka* in the cult of the *Ala-Flute* people of Walpi. Thus, in the Flute observance of Walpi, we find *Alosaka* personified by Amitola on the fifth day.

"Amitola [of the *Asa* clan] arrayed himself in a white kilt and painted a streak of white under his right jaw and a curved mark under his left eye. He tied a tortoise rattle below each knee and adorned himself with many bead necklaces, putting the *Alosaka* head-dress (helmet with two horns) on his head. He took a *moñkohu* in his left hand, and a tray of meal in the right. He sprinkled the trail with meal, likewise making upon it symbols of the clouds. Cimo donned his white kilt, and moved the tiles in succession from one to another of the cloud symbols made by Amitola (*Alosaka*). All the other priests stood in a group at the beginning of the trail, where Cimo stood holding the tray of yellow pollen and Hoñyi the blue. Sikyaustiwa had a meal tray; the others carried rattles. All then sang, Lesma (Hani) playing the flute. As they sang *Alosaka* moved the staff (*natci*) and tiles, advancing them one symbol (cloud) at a time, and then carried them up the ladder. The procession followed slowly in four lines of four each, close along the pollen trail, singing as they walked. After *Alosaka* had carried all the tiles and the *natci* staff to their ultimate positions, the four chiefs, sprinkling meal as they advanced, went up on the roof. *Alosaka* returned to the chamber, but the others remained singing, and only four chiefs mounted the roof. The sun rose before the ceremonial raising of the standard on the roof had ended."

At the dramatization of the reception of the Flute priests by the Bear and Snake chiefs on the eighth day, *Alosaka* likewise is present at Walpi and performs a significant part. He draws the

line of meal on the ground and makes four cloud symbols in meal just as he did when the standard was carried to the housetops on the previous day just described. The priests advanced from symbol to symbol, halting at each to repeat a stanza of their song. At the close *Alosaka* drew the end of his *moñkohu* along the line of meal (as in the exercises of *Yuñya* at the conclusion of the New-fire ceremonies), erasing it from the floor of the *Moñ-kiva*. On the ninth day he escorted the procession of Flute girls, the Flute boy, and others to the spring called Tawapa. Finally *Alosaka* headed the procession from this spring to Walpi on the closing day of the Flute ceremony at Walpi.

The *Ala-Flute* legends likewise mention the existence of *Alosaka* among the ancestors of this group of clans when they joined the Snake phratry at Walpi, which would seem to indicate the existence of a phase of the *Alosaka* cult in the former home of the *Ala* clan at Tokonabi in southern Utah. As supporting this evidence the existence of a Mountain-sheep clan among the *Ala* and the personation of *Alosaka* in the Flute ceremony at Walpi may be mentioned.[1] The name of the *Ala* clans is also significant in this connection, and it is not improbable that a form of *Alosaka* cult may have been introduced by the *Ala-Flute* phratry.

The *Ala* clan long ago lived with the Snake clan at Tokonabi, on Colorado river, not far from Navaho mountain. For some reason these clans and others associated with them migrated southward. The *Ala* separated from the Snake at a place called Sisikibi. The former continued southward and founded Old Walpi; the latter went eastward and eventually united with a large settlement of Flute people at Leñanabi, the ruins of which lie about thirty miles from Walpi. The combined *Ala* and Flute clans later abandoned Leñanabi and joined the Snake people at Walpi, as biennially dramatized.

[1] There is no personation of *Alosaka* in the public Flute dance at Oraibi and the Middle Mesa, and there is also no representation of the *Asa* clans.

The claims of the different clans that their ancestors introduced the *Alosaka* may be harmonized by provisionally accepting them with the reservation that there were formerly different aspects of this worship which have now become so amalgamated that it is impossible to separate them. The escort duty of *Alosaka* may readily be referred to an introduction by the *Asa* clans, while the Squash phratries may have brought other phases of it as legends recount. There is no doubt, however, that there was an *Alosaka* worship at Awatobi, where the shrine and idols of the *Alosaka* of that pueblo are known, and where there were Squash clans; nor does there seem to be any doubt that these clans once lived on the Little Colorado far south of Walpi. There are also legends that on the Awatobi mesa there was once a pueblo called Tcübki, which would imply Horn (*Ala*) clans.

The clan composition of the *Aaltû* society is: *Asa*, 7[1]; *Honani*, 7; *Tuwa*, 6; *Honau*, 3; *Patki*, 5; *Tabo*, 4; *Leñya*, 1; *Katcina*, 1; *Kokop*, 2; *Ala*, 2; *Tcüa*, 2; *Isauûh*, 1; *Piba*, 1. There are two *Aaltû* chiefs, one, Tuwasmi, from the *Asa* clan, the other, Kotka, from the *Honau* or Bear clan, one of the oldest in Walpi. This dual chieftaincy is certainly suggestive of a dual origin, and, as elsewhere shown, the *Alosaka* cult shows evidences of a dual nature.

The Kwakwantû Society

More definite information can be given regarding the ancient home of the clans which brought the *Kwakwantû* society to Walpi. The *Kwakwantû* or *Kwani* (Agave) priesthood was introduced by the *Patki* or Rain-cloud clans from Palatkwabi, the mythic "Red Land of the South." This society, in which *Patki* men outnumber all others, is a fraternity of warriors, and their chief, Anawita, personates a Fire-god in the New-fire rites.

Each member wears on his head a gourd helmet with a long

[1] So far as numbers go a majority of the *Aaltû* belong to *Asa-Honani* (14), and the *Tuwa-Patki-Tabo-Piba* (16). Thirty out of forty-three members belong to these two groups of clans, one of which came from the Rio Grande, the other from the Gila

curved extension ornamented on each side with a rain-cloud symbol. Each also carries a small wooden effigy of the horned serpent (*Palülükoñ*), which may possibly be a totemic badge. One of the characteristic marks of the society is a white crescent painted under the eye. The *Kwakwantû* as a society claim that the women who celebrate the *Lalakoñti* are their sacerdotal sisters.

Ceremonial Paraphernalia

moñkohus

Two of the societies carry in their hands wooden objects called *moñkohus*, "chief's wooden slats," which appear to be badges, but their exact meaning is problematical. The *moñkohus* of the *Kwakwantû* society were small flat slats of agave stalks with the head of a horned snake carved on one end. These slats, as a rule, were slightly curved, painted white, with four incisions arranged in pairs on one side. They were carried horizontally in the hand by a string fastened in the side opposite the notches. That these objects are effigies of the Great Horned Snake there can be no doubt, for many of them are very realistically carved, and the name *Palülükoñ* is applied to them.

Among the larger whitened stalks of agave used by the *Kwakwantû* society there is one six feet long and of proportionate thickness, which has the head of the Great Snake carved on the end. This herculean club is carried by the chief and the conductors of the novices in their nocturnal patrols. Bearing in mind the claim of the *Kwakwantû* that their clan in the *Patki* introduced the Plumed Snake cult into Walpi, and the fact that they carry slats carved in imitation of snakes, the reader's attention is called to the staffs representing snakes which occur so constantly in Nahua pictures of gods.[1]

[1] "The [Nahua] word *cohuatl* (snake) secondarily designates any implement in the nature of a stick or staff. It was from his wooden staff, decorated with plumes, that Quetzalcohuatl derived his name, precisely as that of Tezcatlipoca was derived from his fiery shield: this is clear from the circumstance that this staff appears in some of

The *moñkohus*[1] of the *Aaltû* society were also flattened sticks, painted white, and suspended by a cotton string. To them were fastened four eagle feathers, but in no instance had they the form of snakes. At one end of these sticks terraced figures, representing rain-clouds, were cut, and across them lines representing falling rain were drawn (plate IV, 3, 4).

I have not observed *moñkohus* in the hands of the *Wüwütcimtû* and the *Tataukyamû*, both of which societies, however, have ears of corn in their hands in their public performances. These *moñkohus* are evidently badges, and the fact that those of the *Kwakwantû* have heads of a horned snake cut upon them is significant. The *Kwakwantû* society is reputed to have brought the cult of the Plumed Snake, *Palülükoñ*, to Walpi, consequently these sticks are possibly totemic in character.

The members of the *Aaltû* society, however, do not bear these totems, but on their *moñkohus* we find rain-cloud and other symbols. These objects are called *hümi-moñkohus*, i. e., corn *moñkohus;* the terraces at their extremities, *omautcoki*, and the feathers suspended to them, *paho adta*, i. e., "its *paho*."

ALOSAKA HELMETS

The head-dress worn by the men of the *Aaltû* society represents horns of the mountain sheep, mounted on a cap of basketry. These horns, which are often of huge size, are made of buckskin and painted white. Raw cotton is glued to them, and feathers attached to strings hang down over the face of the wearer.

The novices of the *Aaltû* society, in the abbreviated presentations preceding their final initiation, wear a basket helmet with

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the Mexican pictures in the form of a snake having plumes attached to its head." Payne, *History of the New World Called America*, vol. I, p. 590.

[1] From the forms of these objects little idea can be obtained regarding what they represent. From the fact that the *moñkohus* of the *Kwakwantû* have snake heads upon them, and are totemistic, it would appear that the *moñkohus* of the *Aaltû* had the same import, but of this there is no proof. The women of the *Mamzrautû* society carry in their hands wooden slats upon which ears of corn surmounted by their totems are represented.

short curved gourds painted green and white, representing the half-grown horns of the mountain sheep. On their final induction into the society they are permitted to wear the large horns made of buckskin, a specimen of which is elsewhere figured.[1] Novices of the *Aaltû* have a blue or green crescent painted under one eye, in contrast with the white crescent of the *Kwakwantû*.

KWAKWANTÛ HELMETS

The members of the *Kwakwantû* were observed to wear two kinds of helmets, one with a single long curved gourd representing a horn (plate IV, 5), the other with a round top, but hornless. Both were painted white, and on each side there was a triple rain-cloud symbol in black outline. Raw cotton was attached to these objects, which were mounted on a close-fitting basketry cap to the rim of which stringed feathers were fastened. The single-horn helmets were called *tokonaka;* the hornless ones, *tutumbeca*. Concerning the meaning of these objects the best information elicited from the priests was that they represented chiefs, a common way of designating ancestral clan totems. Figures of gods with a single horn ornamented with rain-cloud symbols, to all intents and purposes identical with the *tokonaka*, are called *Cotakinuñwa*, "Heart of All the Sky," or the Sun; and the association of this god with lightning and sun emblems might indicate that *Tokonaka* is a solar or sky god.

General Remarks on the New-fire Ceremony

Were this article intended as a comparative treatment of New-fire rites we might instance many examples among other races where ceremonies similar to those described in the preceding pages are performed; but such comparisons would be imperfect on account of the great mass of detail on Pueblo New-fire rites which as yet is unknown. This festival is celebrated in five of

[1] Fifteenth Annual Report of the Bureau of American Ethnology. The helmet of the novices is called *cakwa ala*, "green horn," aptly so called; that of members, *pañ ala*, "mountain-sheep horn."

the Hopi pueblos, yet we have not a single fact in regard to the ceremony in any pueblo except Walpi. The same obscurity envelops the rite at Zuñi, Jemez, and the Rio Grande pueblos, where most instructive fields of research await the ethnologist. In a general way it may be said that the Walpi New-fire rites are to be regarded as fire worship, but more specifically as sun and germination worship, all of which are intimately connected. The *Aaltû* and *Kwakwantû* societies, which kindle the new fire, are not those which perform the erotic dances; and the other two, *Wüwütcimtû* and *Tataukyamû*, take no part in the act of kindling the new fire.

The most important conclusion reached from these studies is that the rites described were brought to Walpi by clans which once lived in Gila valley. It remains to be seen how closely they resemble the New-fire rites of the aborigines of Mexico.

THE TOARA CEREMONY OF THE DIPPIL TRIBES OF QUEENSLAND

By R. H. MATHEWS

As no description of the *To'-a-ra*[1] ceremony of initiation has hitherto been published, I shall endeavor to give a brief account of it, gathered from the natives, in which the principal parts of the ceremonies are detailed with sufficient fulness, it is hoped, to enable comparison between this and similar rites in different parts of Australia. The country occupied by the people among whom the *Toara* is practised comprises the Queensland coast from Port Curtis to the New South Wales boundary, extending inland to include the vailey of Dawson and upper Condamine rivers. The principal languages prevailing in this area are the Dippil, Turrubul, Kahbee, Goonine, Kurranga, Kanalloo, and others. I have given the name of the first-mentioned tribe to the whole group, as their language is the most widespread and best known. All these tribes are divided into four intermarrying sections known as Barrang, Banjoora, Bunda, and Terrawine[2]; the first two form a phratry called Karpeun, and the latter two constitute the Deeyajee phratry.

When the headmen consider that there are a sufficient number of youths old enough to be admitted as men of the tribe, messengers are despatched to invite their neighbors—who will probably also have some boys of suitable age—to participate in the ceremonies. When a messenger arrives at his destination, he approaches the men's quarters about sunset, and, sitting down, commences tapping two boomerangs together, or a boomerang

[1] Also pronounced *Do'-a-ra* and *Too'-a-ra* in different parts of the district.

[2] *Australian Divisional Systems;* Journ. Roy. Soc. New South Wales, vol. XXXII, p. 82.

and a throwing-stick. When this is heard in the camp, all the men give the shout usual on the arrival of a stranger. The messenger again taps his boomerangs, which is answered as before. He repeats the tapping for the third time, and the men in the camp proceed a short distance toward him and light a fire. A few of the chief men then go to the messenger and invite him to come up to the fire. On his arrival there, the oldest man present says to him, employing the indirect form of speech used in connection with secret matters, "You appear to have found something" —to which the messenger assents. "Where did you find it?" is next asked, upon which he states the name of the hunting grounds of his own tribe, and proceeds to deliver the details of the message, accompanied by the sacred bullroarer, which is always used on these occasions.

In summoning the tribe who are to act the part of liberating the novices from the men who have the custody of them in the bush, as later described, the messenger, in addition to the usual emblems of his mission, hands to the headman a small parcel, wrapped in tea-tree bark, consisting of a portion of a feather or of a porcupine's quill, a piece of an animal's skin, or the like, and tells him that the other part of it is hidden in the embankment bounding the *Toara* circle.

While the several envoys are away assembling the neighboring tribes, the local mob is engaged in preparing the ground for the reception of their visitors. A clear, level spot is selected near the camp, and all the grass and rubbish removed from the surface. Around this space small logs and sticks[1] are laid in the form of a circle, and are covered with loose earth, forming a low wall or embankment about 18 inches high. The space thus enclosed ranges from 70 to 100 feet in diameter, according to the number of people who are expected to attend. In a secluded locality about a quarter or half a mile away (the distance depending

[1] This way of building the embankment differs from that ordinarily employed in other communities, which consists of heaping up the loose earth only.

upon the character of the country), another round space is cleared and enclosed in the same way. Within this second circle two stumps, resembling those used in the *goonaba* enclosure of the Kamilaroi tribes,[1] are inserted in the ground. A small opening is left in the surrounding wall of either circle, and a narrow cleared pathway leads through the forest from one to the other. None of the trees is marked, either at the distal circle, or along the path.

The preliminary performances at the main camp, the procedure on the arrival of the different strange tribes, and other routine matters so closely resemble corresponding portions of the ceremonial of other communities with which I have dealt, that they will not be described here. When the tribe to whom the portion of feather or other secret object has been sent has arrived at the *Toara* ring, the headmen commence to search for the other moiety, which is concealed somewhere in the earth and logs of which the embankment is composed. When it is found there is much rejoicing, and the men dance round the ring shouting the names of male and female genital organs, shady trees, hills, and some of the totems of their tribe. If the object has been hidden by covering it in such a way as to render the search for it unreasonably difficult, the tribe who are expected to discover it may quarrel with the local mob, which may result in a fight.

On the eve of the day settled upon for taking charge of the novices who are awaiting initiation, all the people of both sexes move up close to the *Toara* ring, where they encamp for the night. Shortly after daylight next morning the novices are painted all over with red ocher and grease, and are placed sitting with their heads bowed, close to the embankment. Some small green bushes are then held for a few moments in the blaze of a fire, after which the leaves are pulled off, and whilst still warm are rubbed on the bodies of the novices.

When all preparations have been completed, the men stand

[1] *The Bora of the Kamilaroi Tribes;* Proc. Roy. Soc. Victoria, vol. IX, n. s., p. 143.

with their faces toward the farther ring and shout, and stamp with their feet, whereupon the mothers of the novices, who are carrying burning brands, step on top of the embankment, and throw the fire-sticks into the central part of the ring. The other women and some of the men throw burning sticks in the same way. The guardians now help the novices to their feet and conduct them along the path toward the other enclosure. A number of armed men then emerge from the scrub on one side, as if they were a strange tribe, and throw spears and boomerangs over the heads of the men and boys as they march along.

On reaching the farther ring, the novices are placed standing in a row near the entrance, and are permitted to raise their eyes and observe two old men who are standing upon the stumps, before referred to, within the enclosure. The heads of the novices are again bent down, and they are led away by their guardians to a camp in the bush. The stumps are then pulled out of the ground and burnt by some of the men who remain behind for that purpose. It should be stated that as soon as the boys were taken away from the *Toara* circle, the women followed them for 50 or 100 yards. They then turned back and packed up all their movables, and, accompanied by some old men who had been instructed to remain with them, went away to another camping place some distance off.

We must now return to the novices. At nightfall a convenient camping place is reached, and a bough yard made for the boys, with green leaves strewn on the floor for them to sit or lie upon, accompanied by their guardians. The rest of the men, who are collectively called the *kooringal*, camp near by, and during the evening imitate different animals, some of which are the totems of those present, while others are connected with myths and superstitions current among the people. These performances are in the main analogous to what I have reported in other tribes.

Next morning, or the day following, each novice is subjected to the extraction of one of his upper incisor teeth, the process

being substantially the same as that adopted in the punching out of a tooth in the *Bunan* ceremony previously described.[1]

The novices are taken out hunting with the men during the day, but as they are required to keep their hands shut, both in the camp and in the bush, the guardians open their hands and place a *waddy* or other weapon in them, when they are allowed to join in the pursuit of game.

One day the *kooringal* take the novices into a place where there is very tall grass, or else a thick patch of scrub, or it may be near a deep gully or dry watercourse. Presently a whistling noise is heard, and also the rattling of weapons. The *kooringal* pretend they think it is a strange tribe coming to attack them, and prepare to fight. In a few minutes a considerable number of men, all in their war-paint, rise out of the long grass, or emerge from the scrub, or sally forth from their hiding place in the deep ravine, as the case may be, and running toward the men and novices, commence throwing spears. An apparently real encounter takes place, in which the novices participate, and after a while the strangers retreat and disappear. That afternoon the bullroarer is exhibited to the graduates, with the customary solemnities. A smaller implement, called *bundandaba*, resembling the *moonibear*[2] of the Wiradjuri tribes, is also shown to them. The bullroarer is rubbed on the penis and navel and also under the arms of each novitiate.

Early next morning, in the vicinity of the camp, some men climb trees in which the top foliage is sufficiently dense to hide them, and shout in a clear, weird voice. These men represent the Deeyajee and Karpeun groups; the men of the former occupy the trees on one side of the camp, and the latter ascend trees in the opposite direction. Several other men sit in a cleared piece of ground, the surface of which they beat with strips of bark held in the hand, and in this way make considerable noise. Every novice is brought out in rotation by his guardian, and after some

[1] *The American Anthropologist*, vol. IX, 1896, p. 338.
[2] *Journ. Anthrop. Inst.*, Lond., vol. XXV, p. 311.

deliberation among his kinsfolk, he receives a new name, by which he shall thenceforth be known by his fellows. As each boy is named, all the men give a shout, which is answered by the men in the tops of the nearby trees, giving the novices the impression that ancestral spirits are hovering about in the air. When a Deeyajee boy is named, the men of that division up in the trees imitate the noise made by his totem, or that of some of his relatives—as the trumpeting of an emu, the song of a locust, the howling of a dingo, and so on. A Karpeun boy is next led forward and named, and the men in the trees on the opposite side of the camp imitate certain animals. The headmen say to one another, "Those ghosts have flown over there now," indicating a certain direction with the hand, to make the boys believe that the noise emanates every time from the same individuals, who pass through the air unseen from one side of the camp to the other.

The remainder of the ceremony will be passed over as briefly as possible, because the procedure closely resembles corresponding parts of the ritual elsewhere described in detail. On arriving near the place to which the women had removed the camp, as above stated, the novices are met by their female relatives and are passed through a dense smoke caused by placing green boughs on a wood fire. They are then taken away into the single-men's quarters, where they remain for a period regulated by their age, but they generally have to pass through several *Toaras* before they are permitted to associate with the women or to take a wife.

During this long sojourn in the bush, the graduates are taught a mystic language which is understood by none but those who have passed through the prescribed course of instruction.[1] Particulars relating to the use of stercoraceous matter, the mythology of the tribe, the sacrifice of one or more men during the inaugural gathering, the restrictions relating to the eating of certain foods, and other matters, have already been given in other articles.

[1] *The Bŭrbŭng of the Wiradthuri Tribes;* Jour. Anthrop. Inst., Lond., vol. XXV, p. 310.

THE LORDS OF THE NIGHT AND THE TONALAMATL OF THE CODEX BORBONICUS

By CHARLES P. BOWDITCH

The position which the Tonalamatl holds in the solar year has for a long time been a matter of doubt. Whether the beginning of the Tonalamatl was coincident with that of the solar year, whether the year 1 Tochtli began with the day 1 Tochtli and was intimately connected with the Tonalamatl which began with 1 Cipactli, or whether the Tonalamatl was really the kernel of the year and like the kernel of a nut occupied its center with fifty-two days preceding it and fifty-three days following it, no one as yet has been able to decide. But the publication of the Codex Borbonicus, recently issued by Ernest Leroux at the expense of the Duc de Loubat, gives Americanists an opportunity of studying in the original colors a unique specimen of the Tonalamatl, and offers strong evidence not only of the place of the Tonalamatl in the solar year, but of the real value of the "Acompañados de la Noche"—the Lords of the Night.

Dr Hamy, in his admirable commentary, tells us that this manuscript has been in the library of the Palais Bourbon for over seventy years, but that its origin is unknown. This is unfortunate, since, if its authority is beyond question, we shall be obliged to change in some respects our ideas about the Tonalamatl and the Lords of the Night.

The Tonalamatl of the Codex Borbonicus wants its first two pages containing the first two trecenas. The other pages, containing the Tonalamatl, are in a very admirable state of preservation, the colors being vivid and the designs in most cases clear and uninjured. Each page is large, being nearly a square of fifteen inches on a side. The left-hand upper compartment contains

a square of about ten inches on a side and is given up to the representation of a god or gods or of ceremonies with their various adjuncts and appendages. The lower part of the page is divided into small compartments, placed in two horizontal rows of seven each, while the right-hand side of the page is divided into similar compartments placed in two perpendicular rows of six each. The lower of the horizontal rows and the left-hand row of the perpendicular rows contain the thirteen days of the trecena, each with its appropriate numeral and the accompanying Lord of the Night, while the upper horizontal row and the right-hand perpendicular row contain birds and figures, which have not as yet been thoroughly explained, though some of the figures are the same as those of the Lords of the Night.

So far the Tonalamatl does not differ in any especial manner from other Tonalamatls, notably from that of the Aubin collection, but the fact that this Tonalamatl is followed by two pages on which is shown the full cycle of fifty-two years, or a calendar round, is the important point. On these two pages (numbers 21 and 22 in the Loubat reproduction), the center of each is occupied by a picture, and around these pictures are fifty-two compartments (twenty-six on each page) containing what have been called the initial days of the years in a cycle of fifty-two years. These days, if not initial, at least gave the names to the years. Thus at the left-hand lower corner of page 21 the first year is denoted by 1 Tochtli accompanied by a Lord of the Night; at the right is 2 Acatl with its accompanying Lord of the Night, and so on in a sinistral circuit about the central picture the years succeed each other until we reach the twenty-sixth year, 13 Acatl. The remaining years follow on page 22 in the same order, beginning with 1 Tecpatl in the left-hand lower corner and ending with 13 Calli, and in each compartment is the accompanying Lord of the Night. It is these Lords of the Night with which we have especially to deal. These Lords, as given by Gallatin and Léon y Gama, run in the following order:

Xiuhtecuhtli tletl, or tetl,	Lord of the year, fire,
Tecpatl,	flint,
Xochitl,	flower,
Centeotl,	Goddess of maize,
Miquiztli,	death,
Atl,	water, Goddess Chalchihuitlicue,
Tlazolteotl,	Goddess of love,
Tepeyollotli,	Deity, who lived in the mountains,
Quiahuitl,	rain, Tlaloc.

The first year on page 21 of the Codex Borbonicus is, as has been stated, 1 Tochtli, accompanied by Miquiztli, the fifth Lord. As there are 365 days in the year, a number divisible by 9 with a remainder of 5, we should expect to find that the Lord accompanying the next year, 2 Acatl, would be the first Lord, Xiuhtecuhtli ($5 + 5 = 10 - 9 = 1$); but so far from this being the case, it is the third Lord, Xochitl. This shows that the Lords of the Night do not run on from one year to another in regular order, but that there is some irregularity in the sequence. Of what does this irregularity consist? Let us see what Lords accompany each year. By referring to Table 1, we see that the years are accompanied by the Lords in the following order:

1 Tochtli by the fifth Lord, Miquiztli.
2 Acatl by the third Lord, Xochitl.
3 Tecpatl by the ninth Lord, Quiahuitl Tlaloc, etc.

The distances between these Lords (not counting in each case the one at the beginning, and counting the last one) run throughout the cycle thus: 7, 6; 7, 6, 6; 7, 6; 7, 6, 6, etc., excepting in one case where the distances run 7, 6; 7, 6; 7, 6, 6.

How can this apparent irregularity be accounted for? Very simply. On referring to the Tonalamatl, we see that on the beginning page, the third trecena begins with 1 Maçatl with the ninth Lord, Quiahuitl. The first trecena would then necessarily begin with 1 Cipactli with the first Lord, Xiuhtecuhtli. The last day of the twentieth trecena is 13 Xochitl with the eighth Lord, Tepeyollotli. This must necessarily be so, for as there are

$20 \times 13 = 260$ days in the Tonalamatl, and as $260 \div 9 = 28$ with a remainder of 8, the eighth Lord would accompany the last day. After this a new Tonalamatl begins with 1 Cipactli. Is this first day of the new Tonalamatl accompanied by the ninth Lord, Quiahuitl, or does the new Tonalamatl begin with the first Lord as did the old one, thus neglecting the ninth Lord and leaving him out of the count?

Léon y Gama[1] says: "Moreover, as the companions were only nine, and the days of this second calendar 260, they could not complete the period and one was left over, which was Quiahuitl, which in the new count, which was framed to regulate the solar count, came now as a companion to Cipactli, which in the beginning of the year had had Tetl for its companion, and thus though there were some of the same symbols and numerical characters of the days, which were repeated, the companions, which went with them in the last five months of the common year, were different."

Boturini[2] says that the nine Companions of the Night did not enter the five intercalary days of the year, and gives as a possible reason for this that otherwise the same Lord of the Night would not accompany the first day of the following year.

Gallatin[3] says: "As the number 'nine' is not a factor of 260, the first day of the thirteenth [he means the fourteenth] month, which is the 261st day of the year, was distinguished from it by the sign of nine, and in the same manner every day of the five last months was distinguished by a sign of this series differing from the sign of the same series, annexed to the days of the five first months, which have the same name and numerical character."

The first and last of these writers can never have heard of the Codex Borbonicus, or, having seen it, they have denied its authority. Let us take up the numeration from the beginning:

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[1] *Las Dos Piedras*, Mexico, 1832, p. 33.

[2] *Idea de una Nueva Historia*, etc., Madrid, 1746, p. 57.

[3] *Transactions* of the American Ethnological Society, vol. 1, p. 62.

The first year, 1 Tochtli, is accompanied by the fifth Lord, Miquiztli. On referring to the Tonalamatl, which precedes, we find that 1 Tochtli with the fifth Lord, Miquiztli, is found on the day beginning the twentieth trecena, or, in other words, is the 248th day of the Tonalamatl, which comes to an end 12 days thereafter with 13 Calli. If the 248th day of the Tonalamatl is the first day of the year (considering 1 Tochtli for the present as the true initial day of the year), then the 260th day of the Tonalamatl is the 13th day of the year, and the 261st day, or the first day of the next Tonalamatl, is the fourteenth day of the year. The 260th day of this second Tonalamatl will then be the 273d day of the same year, and the 261st day, or the first day of the third Tonalamatl, will then be the 274th day of the same year. In other words, two Tonalamatls will have been finished during the year.

If now the Lords had run on through the Tonalamatl and through the year in continuous sequence, we should find that the first day of the second Tonalamatl, or the fourteenth day of the year, would have been accompanied by the ninth Lord, Quiahuitl, and the first day of the third Tonalamatl, or the 274th day of the year, by the eighth Lord, Tepeyollotli; while the 92d day of the third Tonalamatl, or the 365th day of the year, would have been accompanied by the ninth Lord, Quiahuitl, and the 93d day of the third Tonalamatl, or the 366th day of the year (= 1st day of the succeeding year), would be accompanied by the first Lord, Xiuhtecuhtli. As a matter of fact the Lord is the third in order, Xochitl.

This would seem to prove that Léon y Gama and Gallatin are both wrong, and that instead of counting the Lords in continuous order from one Tonalamatl to the other, the Indians began again with each new Tonalamatl and let the day 1 Cipactli be accompanied in each case by the first Lord, Xiuhtecuhtli. In other words, at the end of each Tonalamatl they neglected the Lord which was left over and began again with the first Lord. If this

were done, whenever one Tonalamatl came to an end within a solar year, we should gain one in the series of Lords, and when two Tonalamatls came to an end within a solar year, we should gain two in the series of Lords. This is the case in the Codex Borbonicus, as is shown in Table I, which gives the names of the years, the number of Tonalamatls which came to an end in each year, and the name of the Lord which would occur if the count of the Lords was made in a continuous sequence, together with the name and number of the Lord at the beginning of each year, as given on pages 21 and 22 of the Codex Borbonicus.

A proof of this can be shown by a slight calculation. If we take any year in the first column, add up the number of Tonalamatls in the second column down to and including the number opposite the year, then add this sum to the number of the Lord in the third column, and subtract as many times 9 as are contained in this final sum, the result will be the number of the Lord in the fourth column. Thus, take the year 1 Acatl–2 Tecpatl; add $2+1+2+1+1+2+1+2+1+1+2+1+2+1=20+3$ (the number of the Lord in the third column) $=23$; deduct 8 (2×9), and the result is 5 (the number of the Lord in the fourth column).

If we recognize this Codex as correct, the result must be that the Lords of the Night did not have the important place which they have been supposed to hold. If they had been used in a continuous sequence, instead of beginning the series anew with each new Tonalamatl, it would have been possible to differentiate the days of nine Tonalamatls and to tell in which of the nine Tonalamatls any day occurred, thus covering a space of $9\times 260=2340$ days. Again, in like manner it would have been possible to differentiate the days of nine calendar rounds of fifty-two years, or $9\times 18{,}980=170{,}820$ days; for, if a calendar round began with 1 Tochtli accompanied by the fifth Lord, Miquiztli, the next calendar round would then begin with 1 Tochtli accompanied by the fourth Lord, Centeotl, and the third calendar round would begin

with 1 Tochtli accompanied by the third Lord, Xochitl, and so on.

But if the surplus Lord is neglected at the end of each Tonalamatl, each Tonalamatl will begin with the same Lord, Xiuhtecuhtli, and each calendar round will begin with the fifth Lord, Miquiztli, and the only result of the presence of the Lords will be the differentiation of the days which belong to the parts of two different Tonalamatls which occur in one solar year; and even this will only be possible if, as Léon y Gama states,[1] the Indians did not think it necessary to give the name of the Lord accompanying the first twenty trecenas in a year, but only those accompanying the last eight trecenas.

But we have no right to impute to the Mexicans and Mayas a larger use of their calendar system than they can be proved to have possessed, and I know of no proof in the Mexican picture-writings that the Indians used the Tonalamatls and the Lords for differentiating the days in any longer period of time than a solar year. Is there a single case of a Xiuhmolpilli symbol being accompanied by the sign of a Lord, or indeed is there any case where the day symbol is so accompanied except in the Tonalamatls themselves? Is there anything to show that the Lords, besides their work of distinguishing the days of a solar year, which occupied the last eight trecenas, from those occupying the first twenty trecenas, did more than to play a part in the divinations to which the Tonalamatl was devoted?

The only escape, as it seems to me, from this deduction is that the Codex Borbonicus was written by an ignorant person, or by a fraudulent writer. The beauty of the drawings and the care which was evidently taken in preparing them are a refutation of the first suggestion; and the fact that it has been in the library of the Corps Legislatif for seventy years would seem to do away with the possibility of fraud, as in the early part of this century so little interest was taken in American archeology and ethnology

[1] *Las Dos Piedras*, p. 33.

that there was no inducement to spend time and money in fraudulent reproductions.

From this examination I am led to believe that the views expressed by others, namely, that the Tonalamatls were not continuous from one year to another, and were distinct periods occupying some particular part of the solar year, are erroneous. If this were so, and if but one Tonalamatl occurred in each year, we should expect to find the Lords of the Night either confined to the Tonalamatls and not accompanying the initial days of the year, or else following one another throughout the year continuously or with a regular interval. But we actually find these Lords repeated with irregular intervals, and these intervals are regulated by the number of Tonalamatls ending in each solar year. Apparently, therefore, the Tonalamatls succeeded each other, continuously lapping over from one year to the other, while the Lords of the Night accompanied the Tonalamatls and lost one of their number with the ending of each Tonalamatl.

Moreover, the first day of the Tonalamatl coincided, in turn, during the course of 73 Tonalamatls or 52 years, with every day of the solar year which ended with a 3 or an 8, and that day could never coincide with the first day of the solar year unless the year itself began with Cipactli, for I know of no Tonalamatl which begins with any other day than Cipactli. (See Table II.)

NOTE.—We find the Lords of the Night bearing as a body the same name as one of the months of the Mexican year, namely Quecholli. It would, therefore, seem that the Lords and the month had some connection. This connection is apparent when we consider that Léon y Gama states that the names of the Lords were not given to the days of the first twenty trecenas (which is the same as the first thirteen months or two hundred and sixty days), but began to be attached to the days of the next trecena or fourteenth month. If this is the case, it would be very natural that the month should take its name from the Lords, or the Lords from the month, and this fact would tend to prove that Quecholli was in reality the fourteenth month, as indeed has been believed by students of the subject with some notable exceptions.

TABLE I

Year	*Number of Tonalamatls ending in each solar Year.*	*Number and name of the Lord of first day of year in case the count were in continuous sequence.*	*Number and name of the Lord actually found on pages 21 and 22 of Codex Borbonicus.*
1 Tochtli			5 Miquiztli
1 Tochtli–2 Acatl	2	1 Xiuhtecuhtli tetl	3 Xochitl
2 Acatl–3 Tecpatl	1	6 Atl	9 Quiahuitl
3 Tecpatl–4 Calli	2	2 Tecpatl	7 Tlazolteotl
4 Calli–5 Tochtli	1	7 Tlazolteotl	4 Centeotl
5 Tochtli–6 Acatl	1	3 Xochitl	1 Xiuhtecuhtli tetl
6 Acatl–7 Tecpatl	2	8 Tepeyollotli	8 Tepeyollotli
7 Tecpatl–8 Calli	1	4 Centeotl	5 Miquiztli
8 Calli–9 Tochtli	2	9 Quiahuitl	3 Xochitl
9 Tochtli–10 Acatl	1	5 Miquiztli	9 Quiahuitl
10 Acatl–11 Tecpatl	1	1 Xiuhtecuhtli tetl	6 Atl
11 Tecpatl–12 Calli	2	6 Atl	4 Centeotl
12 Calli–13 Tochtli	1	2 Tecpatl	1 Xiuhtecuhtli tetl
13 Tochtli–1 Acatl	2	7 Tlazolteotl	8 Tepeyollotli
1 Acatl–2 Tecpatl	1	3 Xochitl	5 Miquiztli
2 Tecpatl–3 Calli	2	8 Tepeyollotli	3 Xochitl
3 Calli–4 Tochtli	1	4 Centeotl	9 Quiahuitl
4 Tochtli–5 Acatl	1	9 Quiahuitl	6 Atl
5 Acatl–6 Tecpatl	2	5 Miquiztli	4 Centeotl
6 Tecpatl–7 Calli	1	1 Xiuhtecuhtli tetl	1 Xiuhtecuhtli tetl
7 Calli–8 Tochtli	2	6 Atl	8 Tepeyollotli
8 Tochtli–9 Acatl	1	2 Tecpatl	5 Miquiztli
9 Acatl–10 Tecpatl	1	7 Tlazolteotl	2 Tecpatl
10 Tecpatl–11 Calli	2	3 Xochitl	9 Quiahuitl
11 Calli–12 Tochtli	1	8 Tepeyollotli	6 Atl
12 Tochtli–13 Acatl	2	4 Centeotl	4 Centeotl
13 Acatl–1 Tecpatl	1	9 Quiahuitl	1 Xiuhtecuhtli tetl
1 Tecpatl–2 Calli	1	5 Miquiztli	7 Tlazolteotl
2 Calli–3 Tochtli	2	1 Xiuhtecuhtli tetl	5 Miquiztli
3 Tochtli–4 Acatl	1	6 Atl	2 Tecpatl
4 Acatl–5 Tecpatl	2	2 Tecpatl	9 Quiahuitl
5 Tecpatl–6 Calli	1	7 Tlazolteotl	6 Atl
6 Calli–7 Tochtli	1	3 Xochitl	3 Xochitl
7 Tochtli–8 Acatl	2	8 Tepeyollotli	1 Xiuhtecuhtli tetl
8 Acatl–9 Tecpatl	1	4 Centeotl	7 Tlazolteotl
9 Tecpatl–10 Calli	2	9 Quiahuitl	5 Miquiztli
10 Calli–11 Tochtli	1	5 Miquiztli	2 Tecpatl
11 Tochtli–12 Acatl	1	1 Xiutecuhtli tetl	8 Tepeyollotli
12 Acatl–13 Tecpatl	2	6 Atl	6 Atl
13 Tecpatl–1 Calli	1	2 Tecpatl	3 Xochitl
1 Calli–2 Tochtli	2	7 Tlazolteotl	1 Xiuhtecuhtli tetl
2 Tochtli–3 Acatl	1	3 Xochitl	7 Tlazolteotl
3 Acatl–4 Tecpatl	1	8 Tepeyollotli	4 Centeotl
4 Tecpatl–5 Calli	2	4 Centeotl	2 Tecpatl
5 Calli–6 Tochtli	1	9 Quiahuitl	8 Tepeyollotli
6 Tochtli–7 Acatl	2	5 Miquiztli	6 Atl
7 Acatl–8 Tecpatl	1	1 Xiuhtecuhtli tetl	3 Xochitl
8 Tecpatl–9 Calli	1	6 Atl	9 Quiahuitl
9 Calli–10 Tochtli	2	2 Tecpatl	7 Tlazolteotl
10 Tochtli–11 Acatl	1	7 Tlazolteotl	4 Centeotl
11 Acatl–12 Tecpatl	2	3 Xochitl	2 Tecpatl
12 Tecpatl–13 Calli	1	8 Tepeyollotli	8 Tepeyollotli
13 Calli–1 Tochtli	1	4 Centeotl	5 Miquiztli.

TABLE II

Year	*Tonalamatl begins on the—*	*Year*	*Tonalamatl begins on the—*
1 Tochtli	13th day of year	1 Tecpatl	143d day of year
	273d " " "	2 Calli	38th " " "
2 Acatl	168th " " "		298th " " "
3 Tecpatl	63d " " "	3 Tochtli	193d " " "
	323d " " "	4 Acatl	88th " " "
4 Calli	218th " " "		348th " " "
5 Tochtli	113th " " "	5 Tecpatl	243d " " "
6 Acatl	8th " " "	6 Calli	138th " " "
	268th " " "	7 Tochtli	33d " " "
7 Tecpatl	163d " " "		293d " " "
8 Calli	58th " " "	8 Acatl	188th " " "
	318th " " "	9 Tecpatl	83d " " "
9 Tochtli	213th " " "		343d " " "
10 Acatl	108th " " "	10 Calli	238th " " "
11 Tecpatl	3d " " "	11 Tochtli	133d " " "
	263d " " "	12 Acatl	28th " " "
12 Calli	158th " " "		288th " " "
13 Tochtli	53d " " "	13 Tecpatl	183d " " "
	313th " " "	1 Calli	78th " " "
1 Acatl	208th " " "		338th " " "
2 Tecpatl	103d " " "	2 Tochtli	233d " " "
	363d " " "	3 Acatl	128th " " "
3 Calli	258th " " "	4 Tecpatl	23d " " "
4 Tochtli	153d " " "		283d " " "
5 Acatl	48th " " "	5 Calli	178th " " "
	308th " " "	6 Tochtli	73d " " "
6 Tecpatl	203d " " "		333d " " "
7 Calli	98th " " "	7 Acatl	228th " " "
	358th " " "	8 Tecpatl	123d " " "
8 Tochtli	253d " " "	9 Calli	18th " " "
9 Acatl	148th " " "		278th " " "
10 Tecpatl	43d " " "	10 Tochtli	173d " " "
	303d " " "	11 Acatl	68th " " "
11 Calli	198th " " "		328th " " "
12 Tochtli	93d " " "	12 Tecpatl	223d " " "
	353d " " "	13 Calli	118th " " "
13 Acatl	248th " " "	1 Tochtli	13th " " "

BOOK REVIEWS

Hawaiian Feather Work. By WILLIAM T. BRIGHAM. Memoirs of the Bernice Pauahi Bishop Museum of Polynesian Ethnology and Natural History, vol. I, No. 1. Honolulu: 1899. 4°, 81 + ii pp., 15 pl., 115 figs.

Scientific literature has recently been enriched by the issue of a handsome monograph on Hawaiian feather-work, forming the first part of volume I of the Memoirs of the Bernice Pauahi Bishop Museum in Honolulu. The author, William T. Brigham, Director of the Museum, is without doubt the best qualified person in the world for the task undertaken, not only because of his long residence in Hawaii, but because of his wide knowledge of the anthropology of the Pacific. The material is assembled in excellent manner, the style is simple and direct, and the numerous illustrations are all that could be desired. Ethnologists have thus another interesting group of facts available for use in the great work of building up the history of the race.

The use of feathers in various branches of art was very general over the American continent, as well as in the islands of the Pacific, when Europeans first appeared; but the fragile products were not lasting and in the main they have disappeared from view, while, through lack of foresight of the early explorers, only meager records of their character were made. Although the art itself was practically extinct on these far-away islands fifty years ago, enough has survived to serve as a key to the feather-worker's art. Through the efforts of Mr Brigham this material has been brought together in such a way as to furnish a satisfactory idea of the scope of the art and to give some hints as to its significance and symbolism.

The principal articles described are as follows: *Kahilis* or plume standards, *leis* or feather strands, *ahuula* or capes and cloaks, *mahiole* or helmets, *kukailimoku* or images, and a model of an *anuu*, the house of the temple oracle.

Birds Furnishing the Feathers. — There are but few birds in the Hawaiian islands, and the feathers used in the various native fabrications were derived chiefly from a few species, the three principal ones being the *iiwi* (*Vestiaria coccinea*), a small bird which furnishes vermilion plumage; the *oo* (*Acrulocercus nobilis*), yielding black and yellow feathers, and the *mamo* (*Drepanis pacifica*), yielding orange and black feathers.

The capture of the birds was a very important and difficult matter and engaged the attention of professional hunters. The smaller varieties were captured by means of bird-lime or nets, while others were shot, and some species which furnished a few feathers each were caught, plucked, and set free. These feathers were carefully tied in bunches and formed an important feature in the local trade. It is stated that they were used to some extent as currency, as were shells in other regions.

Kahilis. — The *kahili* in its typical development consists of a long pole or staff, to the upper end of which is attached the *hulu* or cluster of feathers. The latter is generally somewhat cylindrical in shape, but with considerable variation in details of form; the complete object has a general resemblance to a stalk of cat-tail flag, or the swab used in cleaning the bore of a cannon. The feather cylinder is in cases as much as two feet in diameter and six feet or more in length, while the staff often reaches the length of twenty feet or more; the majority, however, are small and can readily be held aloft in one hand. In early times they were used as standards or banners and served as symbols of rank. In Mr Brigham's opinion the prototype of the *kahili* was the leaf of the *ki* (*Cordyline terminalis*) used as a fly-flap. This plant was a symbol of peace, and it is suggested that the *kahili* inherited this significance and gradually developed into a symbol of wider application.

Although in later years the use of the *kahili* became general and thus lost much of its sacredness, the great plumes continued to be used on ceremonial occasions by royal personages down to the close of the monarchy. Mr Brigham believes that "before white influence was felt, no thought was given to fitness of color to particular use or occasion, and it was only by foreign teaching that reds and yellows were reserved for coronations or general state functions, while black and the sombre colors were appropriated to funerals" (page 17).

The remarkable effect of these plume banners in a royal funeral procession is graphically described by the Rev. C. S. Richards, missionary on the islands in 1822: "There is something approaching the sublime in the lofty noddings of the kahilis of state as they tower far above the heads of the group whose distinction they proclaim: something conveying to the mind impressions of greater majesty than the gleamings of the most splendid banners I ever saw unfurled" (page 20).

Leis. — This ornament is formed by attaching feathers to a cord in a symmetric manner, forming fluffy, cylindrical strands. It is used as are strands of flowers to wreath around the neck, head, and shoulders, and is a most pleasing and effective personal embellishment. Generally the smaller feathers were employed, so that the strands were slender

and light, the length varying from 15 to 30 inches. The true feather *leis* are generally of uniform, cylindrical section and are either monochromatic or made up of alternating bands or spirals of mixed colors. In some cases the *leis* have longer feathers inserted at regular intervals, giving a considerable diversity of form.

These strands are not difficult to make, but older examples made of *mamo* or *oo* are held at high prices. Mr Brigham mentions one specimen valued at eight hundred and another at one thousand dollars. Upward of forty of large size are preserved in the Bishop Museum, and other museums have a limited number of examples.

Mahiole or Helmets. — The ancient helmet of the Hawaiians, worn on ceremonial occasions and in war, and primarily a mark of rank, was a work of art and a thing of beauty. It was made of richly colored feathers woven into a net of *olonâ* fiber which in turn was stretched over a skull-cap of neatly plaited wicker. In appearance it strongly suggests the ancient Greek helmet, but it originated no doubt with the Pacific islanders. Mr Brigham suggests that the crest of hair, worn by primitive peoples, extending from the forehead to the back of the neck and made to stand in high relief by proper clipping and dressing, was the prototype. The helmet crest rises in a strong, graceful curve from behind and terminates in a more or less prolonged point or beak in front. In cases it is perforated, the crest-rim being held in place by spoke-like stems rising from the crown. It is of effective and noble shape and when elaborated in the plumage of tropical birds must have rivaled in beauty the richest helmets of any people or period. The author enumerates forty-one helmets, preserved in various places, but several of these have been totally denuded of their plumage by moths or decay, while others consist merely of the wicker foundation over which the feather-decorated cover was drawn. The helmet of King Kaumaulii, who died in 1822, done in colors as a frontispiece to the memoir, is a superb and typical example.

Ahuula. — The capes and cloaks are the most varied and beautiful of the Hawaiian feather products. Mr Brigham describes and illustrates the preparation of *olonâ* fiber and the making of the cord used in the foundation fabric of these garments as well as the manner in which it is netted. It was the common practice to make up the foundation fabric by sewing together many small pieces of net or even of other cloth. To these the feathers were attached in a manner known to nearly all feather-workers; the quill end of the feather was passed around a strand of the fabric and tied with fine thread, and the colors and sizes were so arranged as to produce the desired pattern and effect.

In shape the cloaks and capes are similar. The short upper margin is curved more or less to fit the neck, and the body of the garment widens rapidly as it descends, sometimes with lateral variations of outline, and terminates in a long, curved lower margin. Some capes are quite small, but others are of generous proportions and, indeed, may be said to pass into the cloak which, in its greatest development, measures 60 inches in length and has a border or peripheral measurement of 156 inches. The fastening was a firm braided neck-band continuing in cords or braids long enough to tie in front.

The decorations are generally in rather simple patterns, such as crescents, crescent-like figures, triangles, diamonds, circles, and bands, and are without known significance. The prevailing ground tones are yellow and the pronounced figures are in red, black, and green. The amount of work necessary in the making of one of these large cloaks was enormous, and the time consumed was not always within the limits of a lifetime. They were worn by men; in battle they were a warlike decoration indicating rank, and as trophies of victory were displayed on public occasions, such as funerals, coronations, etc. Generally to-day they are considered as great rarities, and it is not unusual to hear of offers to sell at fabulous prices. The sale of one specimen at twelve hundred dollars is mentioned by Mr Brigham. The list given includes one hundred examples, thirty-three of which are cloaks and the remainder capes.

Kukailimoku. — Perhaps the most extraordinary use to which feathers have been put in art was the making of images of deities. Kukailimoku was a war deity and the Hawaiians sought to honor him by constructing his image in the most costly manner known to them. These images represent the head and neck only, and though made of the most beautifully colored feathers, portray a grotesque and forbidding visage which agrees, however, in general character with the masks of other Pacific peoples. "The structure of these peculiar images is simple. A wicker work, neatly made of the long and very durable aërial roots of the ie-ie (*Freycinetia arborea*) in such a way as to show the general form and features, is strongly braced by hoops or ribs within, and then covered with a tightly fitting net of oloná to which feathers were attached, as in the feather cloaks which will be described later. Red iiwi was the basis to which yellow and black oo was added for embellishment or to demark features. In some cases human hair crowned the head, in others the mahiole or crest. The eyes were of pearl shell, and in those of the Bishop Museum are attached in two ways by carved knobs of dark wood representing pupils. . . . The teeth were those of dogs

saved from the priestly feasts. Ears were represented by small patches of black or yellow, sometimes by both colors united. These gods were carried in battle on kauila poles, most of them having no other sufficient support, and being also too small to be placed over the head of a priest, as has been suggested" (page 35). Naturally, few of these objects have been preserved, and only nine are enumerated in Mr Brigham's list.

Anuu. — Mr Brigham illustrates a very interesting relic of Captain Cook's visit to the island,—a model of the obelisk-like structure from which the priests of the Hawaiian temple delivered their oracular communications. These structures were enclosed within the temple, and the example described by Cook was about four feet square at the base and twenty feet high. They were made usually of wicker and covered with kapa cloth and had a small door for the admission of the priest. The model, which is 20½ inches high and elaborately finished in feathers, was brought away by the Cook expedition and is now preserved in the Hof Museum at Vienna.

The publication of this valuable memoir proclaims the wisdom of the founder of the Bishop Museum, who by his opportune liberality made the preservation of Hawaiian historic treasures possible; and by the same token the world will know that the present management of the institution appreciates the important fact that the benefits of a great public museum should not be confined to a small community in the Pacific and the visitors who happen that way, but should extend to the whole civilized world. WILLIAM HENRY HOLMES.

Pipes and Smoking Customs of the American Aborigines, Based on Material in the U. S. National Museum. By JOSEPH D. MCGUIRE. (Report of the U. S. National Museum for 1897.) Washington: 1899. 8°, pages 351–645, 5 plates, 239 figures.

A work on the pipes and smoking customs of the aborigines of North America has long been needed by students of aboriginal art and custom. The monograph by Mr McGuire has therefore been read with much interest and not without profit. The objects with which it deals have engaged my attention more or less for the last fifteen years, and since my report on *Mound Explorations* (Twelfth Annual Report of the Bureau of Ethnology) was submitted for publication, I have hoped that some one would take up the subject and prepare a memoir on it. More than once, if my memory serves me correctly, the question as to who would do the work was the subject of discussion between myself and others interested. I was pleased, therefore, at the appearance of

Mr McGuire's paper, especially as I know from personal acquaintance with the author that it is his custom, when he takes up a subject, to dig, if possible, to the root and, after due consideration of the opinions of other investigators, to draw and to state fearlessly his own conclusions.

Although this brief review will be devoted chiefly to a discussion of points in regard to which I differ with the author, I take pleasure in stating that his work is timely, and on the whole a valuable, useful, and much needed contribution to the literature relating to aboriginal art and custom. It brings together in compact form the data relating to the subject of which it treats, which could previously be obtained only by search through many volumes and the examination of numerous collections, for the author, notwithstanding the statement in the title of his work, has evidently searched a number of other collections than those of the National Museum, though the latter have been taken as a basis. To a large extent the memoir will relieve students of this laborious research, and any work which does this is always valuable even though all the author's conclusions may not be accepted.

The chief criticism to be offered is directed to what may be deemed a lack of system in classification, and to the author's conclusion as to the very modern origin of some specimens and even types. His classification of pipes appears to be as follows :

Tubular pipes.
Heavy animal and bird pipes.
Rectangular pipes.
Disk pipes.
Bird pipes.
Double conoidal pipes.
Great pipes.
Pipes of the Northwest coast.
Delaware types.
Southern types.
Some unique types.
Pipe bowls without stems.
Monitor pipes.
Micmac pipes.
Iroquoian pipes.
Mound pipes.
Idol pipes.
Catlinite and Siouan pipes.
Miscellaneous Pueblo pipes.
Indeterminate types.
Atlantic coast pipes.
Southern mound pipes.

This classification, if intended to be in any sense scientific, is in my opinion defective.

I am fully aware that a satisfactory classification of the antiquities of any extensive section has not yet been accomplished. It of course would have been a difficult task for Mr McGuire to make an entirely satisfactory arrangement where the forms are so varied, and at the same time to have this correspond in some degree with the geographical

distribution of the types. Yet it seems that a better and more systematic classification than that adopted might have been made. The best results in this direction, so far as my observations extend, are obtained by the method followed by Professor Holmes in dealing with pottery. He first strips, as it were, — that is, omits from consideration, — the ornamentation and figure forms so far as possible, leaving the simple basal forms; these he arranges in comprehensive classes or groups by certain leading or more essential characters, without regard to geographical distribution or ethnic relation. In the subdivision of these primary classes, the more restricted, and, if found practicable, the geographical distribution are taken into consideration. Some such arrangement as this would doubtless have been more scientific, more systematic, and far preferable to that adopted by Mr McGuire. Even an arbitrary division, first into primary groups by leading characters, would have been better than that followed, and would have avoided confusion.

Such titles as "Mound pipes," "Great pipes," "Southern mound pipes," etc., are certainly without any typical or real classificatory signification. The term "Mound pipes," if used with its ordinary meaning, includes a number of types and more than one of Mr McGuire's divisions or classes, hence is confusing and inappropriate; it might stand in a broad sense in contrast with "Surface pipes," or possibly "Modern pipes," but not as referring to a particular type. His application of the term "Monitor pipe" is different from that which I have understood it to be, or at least includes, according to the examples given, types different from that to which I have understood it to be applied. This, however, would be of minor importance if the author were consistent in his arrangement. Comparing his figures 89 to 99, one with another, it would seem that there are included here two, if not three, different types. If we strip his figures 94 (among the monitor types), 128, and 130 (among the mound types) of their ornaments, we have the simple platform or monitor type, the slight curve in the base of the latter being insufficient to constitute a type. The pipes represented by figures 92, 93, and 95 are, at least apparently, but modifications of the platform or monitor type, and such forms are so classed by Thruston. That the term "Mound pipe" has been used, though very indefinitely, to indicate a class or type, is true, but such inappropriate terms should be dropped unless used in the broad sense of contrasting with "Surface pipes," etc.

Another point in which I must differ with the author, if I understand him correctly, is the recent date to which he is disposed to relegate certain types. For fear the inference I draw may not be considered

exactly a fair one, I quote in full his statement made on pages 632-633:

"The typical, elaborate, and artistic curved-base mound pipes, found to be contemporaneous with copper implements, are drilled by means of tubular and solid drills, almost necessarily made of metal. In certain instances the shapes of bowl cavities are of an irregular form, indicative of the use of a loose drill head; which supposition, if correct, would suggest the use of either a pump or strap drill, probably the former, either of which implements appears to have been unknown to the natives prior to the advent of the whites. The polishing of this type of pipe is so perfect as to raise a suspicion of white influences. The common observance on pipes of this type of marks which seem to be those of the file suggests white man's tools in fashioning them. The fine lines cut on many of these pipes would indicate the possible use of steel tools; inlaid eyes suggest modern methods. Carving in the round as perfectly as is done in pipes of this type also implies modern influences and the presence of the white man, as do objects of copper covered with silver found in contact with these pipes. Besides this, the knowledge of the existence of the elephant and the finding in the mounds articles of undoubted European origin are all suggestive of the comparative modern date of pipes of the curved-base mound type. It does not of necessity follow that these pipes were of foreign manufacture, but probably they were the handiwork of fur traders and hunters catering to native trade demands. The figures on these pipes are doubtless of totemic significance, and, with few exceptions, face the smoker; and where an exception is noted, it is commonly observed that the stems on the front end have been broken. The figures beyond, being of men, beasts, birds, and reptiles, are seldom of determinable species. The finding of pipes of this type made of catlinite is indicative of modern influences, though by no means proof of it. The area of distribution of this type conforms to the route of the early French voyageur and of the missionary."

The same view is also expressed in that section of the paper devoted to "Mound pipes" where the author refers to metal implements used in carving them. That some of the classes or types of pipes are post-Columbian cannot be doubted, and I am inclined to agree with Mr McGuire that many of those found in the Atlantic coast region, some of them in mounds and so-called ancient graves, bear the impress of European influence, and are in some instances imitations of European forms, as I believe to be true in regard to some specimens of southern mound pottery; but I am not prepared to go quite so far in this

direction as the author seems disposed to do in the above quotation and elsewhere in his paper.

It is inferred from this language that he believes the pipes he designates "Mound pipes" did not come into use until the French began to make their way into the northwest. He bases this opinion chiefly on three items: the supposed file marks on many specimens, the high polish of others, and the fact that the localities where specimens of this type have been found are along the lines of early French travel—that is, in central and southern Ohio, northwestern Illinois, and eastern Iowa.

If this theory be correct, and these pipes were manufactured by the Indians, is it not a little strange that, with all the digging that has been done in Ohio and eastern Iowa, not a single file nor, so far as I am aware, a single steel or iron drill has been found? In the mounds of western North Carolina, where types apparently copied after European forms have been obtained, parts of iron or steel implements have been discovered. If, however, these "Mound pipes" were made by white traders for barter with the Indians, as Mr McGuire suggests as possible, it is strange that these traders should have adopted a pattern previously unknown both to Europeans and Indians.

Although articles showing European contact have been found in two or three (or at most but very few) mounds of the sections from which the so-called "Mound pipes" have been obtained, the general and almost universal rule has been the other way, though pipes of this form have been found in many. If pipes of this form were made after intercourse between the Indians of these sections and the French began, then the mounds in which they have been found (for their presence is not attributable to intrusive burial) must have been built after such intercourse commenced. This being so, is it not remarkable that there should be in these mounds such a dearth of articles, aside from these pipes, showing contact with the whites?

There is, however, another objection to this theory, at least so far as pipes of this character found in Ohio mounds are concerned. It was not until the first half of the seventeenth century that the French began to work their way up the lakes, nor did they reach the interior of Ohio or traverse the Mississippi until the latter half of the same century. It follows as a necessary result of this theory that the mounds in which these pipes have been found were not built until after this movement of the French began, yet, as is generally admitted, Ohio, from about this date until the Shawnees and Delawares began to come into it about the commencement or in the early part of the following century,

was virtually without inhabitants, they having been driven out by the Iroquois. Who then were the builders of the Ohio mounds? Moreover, it is known from persons who visited the region of Chillicothe about or soon after the middle of the eighteenth century that these works were then looked upon as very ancient.

Taking these facts into consideration, I do not think that Mr McGuire's theory on this point is tenable. I am no advocate of the very great antiquity claimed for the mounds and other ancient works of Ohio, yet I believe most of them antedate the appearance of the whites in that region and are possibly pre-Columbian; and I believe also that the pipes designated "Mound pipes" by Mr McGuire are, both as to design and manufacture, to be attributed to the Indians.

Previous to reading Mr McGuire's memoir I was impressed with the idea that the tubular pipe was comparatively rare and intrusive in the mound region, but he shows that it is of much more frequent occurrence than I supposed. He is inclined to look upon it as the most ancient form of pipe among the aborigines of North America, and is probably correct in this opinion. This being admitted, it would be interesting to ascertain, if possible, the section in which it first came into use. My own impression is that this is to be found somewhere on the Pacific slope.

Other interesting questions are raised by the author in regard to the origin and distribution of certain types; these have an interesting bearing on the lines of aboriginal trade and travel, but they must be passed over without further notice here.

Notwithstanding the criticisms presented, which relate only to two points, we commend the work to students.

CYRUS THOMAS.

The Natural History of the Musical Bow. A Chapter in the Developmental History of Stringed Instruments of Music. By HENRY BALFOUR, M.A. (*Primitive Types.*) Oxford: Clarendon Press, 1899. 8°, 87 pp., 61 figs., map.

There are two ways of looking at human inventions, the one ethnographic, the other technographic. The ethnographer makes his home among tribesmen and tells the story of their industrial lives; the technographer pursues a single art over time and place until he knows it thoroughly. Mr Balfour (whose opportunities in the last regard are unparalleled, since he is curator of the Pitt-Rivers Museum at Oxford) has followed the latter in respect to the musical bow. The monograph here reviewed is devoted to the primitive forms only; a second part

will deal with the more complicated instruments that trace their origin to the lowly forms. But even in its primitive form there are three stages of elaboration: (1) The temporary conversion of the archer's bow into a musical instrument; (2) monochord instruments made for musical purposes only; (3) attachment of a gourd or other resonator more or less permanently to the bow.

The discussion proper is preceded by a delightful summary of oriental and classical legend on the subject. Of the archer's bow type the author finds examples among the Damara, Mandingo, and Kaffirs. Of the second or simple monochord instruments he goes to the west coast of Africa, to Zululand, and also among the Hottentots; a rude form is found in northern India and many in the Negroid Indo-Pacific area. The resonator class is found on the Kongo, in West Africa, and in the south; in fact one can scarcely escape from the sound of it south of the Soudan. Many varieties exist also in India, but Africa is the home of the single-string musical bow.

Balfour traces the African forms throughout the West Indies, middle America, and South America, wherever African slaves were taken by the Spaniards. Saville's modern Maya *hool* is traced to Africa, and in the figure in *Le Manuscrit du Cacique* "nothing of the nature of a musical bow is represented."

In Asia no musical bow occurs north of the Himalayas. The *pinâka vina* of northern India is described as a survival in the midst of instruments of high class, its descendants, the intermediate forms, having dropped out. In hither and farther India, where the musical bow has a local perspective, the problem is more serious than that relating to America. No doubt the primitive musical bow is a survival here from an early time, and while we are guessing how Africa and India possess the same invention, we may turn the problem over to the keepers of a sunken continent or to the believers in the new doctrine that the most intricate devices in regions far apart "grow up" like Topsy. Mr Balfour believes in the common origin for the musical bow in India and Africa. The instrument has a wide distribution in Melanesia or the Negroid Indo-Pacific area. This is extremely interesting, as much so as that larger question how two woolly-haired peoples came to live, the one on the eastern, the other on the western side of the Indian ocean. No resonator is seen here, though it effloresces in southern Asia. Mr Balfour thinks that the two areas are one, the older forms having dropped out of the latter. In the brown Polynesian area the instrument would seem to be sporadic, and it does not occur in Micronesia at all.

The author invokes the coöperation of his brethren in order to make

a complete account of the structure and spread of musical bows. Meanwhile, we commend to all who read this brief notice to take this monograph as an example of how to study and write.

O. T. MASON.

The Bird-Stone Ceremonial. By WARREN KING MOOREHEAD. *Being an Account of some Singular Prehistoric Artifacts Found in the United States and Canada.* Saranac Lake, N. Y.: 1899. 4°, iv, 31 pp., 53 figs.

This brief paper is devoted almost entirely to the description and illustration of those singular artifacts known generally as "bird-stones" from their more or less avian form. From it we learn, first, that specimens of this type are very rarely found in mounds, only two cases being recorded; second, that they are of rare occurrence south of the Ohio river. If these statements are fully borne out by a more complete investigation, they become important in the study of the age, origin, and use of these singular articles. We say "more complete" because the paper bears evidence of haste, as it acknowledges that the distribution has not been carefully determined, and indicates that the data at hand have not been entirely worked up, suggesting that a second edition of the paper might become necessary in order to include this undigested material. It may be questioned whether it would not have been better had the publication been delayed until the work could have been more thoroughly done. However, there doubtless were reasons justifying the course taken, and works of this kind, devoted to the assembling of data relating to a particular class or type of articles, are always welcome to students since they save labor and research. It is therefore to be hoped that Mr Moorehead will complete to his own satisfaction the work so well begun, devoting, we would suggest, a little more space to the workmanship and finish exhibited by these objects, and to a presentation of the material which appears to bear on the question of their probable age. That they are comparatively modern seems to be the tendency of the evidence thus far obtained. As to the use of these articles the author confines himself chiefly to a statement of the opinions which have hitherto been advanced, offering no new solution of the problem.

CYRUS THOMAS.

L'Historien Sahagun et les Migrations Mexicaines. (Par le) COMTE DE CHARENCEY. Alençon: 1898. 4°, 82 pp., tables.

Of the Spanish writers whose accounts of the customs, manners, myths, and history of the natives of southern Mexico have been handed

down from the sixteenth century, none can be more highly regarded than Fray Bernardino de Sahagun, not only on account of the full, graphic, and interesting descriptions of what he saw and heard, but by reason of his presence among the natives of the section named at a period when they had not been materially influenced by the Spanish colonists.

Sahagun arrived in Mexico in 1529, remaining two years at Tepeopulco, thence proceeded to a suburb of the capital, where he spent a year in gathering information from the wise old men of the Nahuas. His *Relacion de las Cosas de Nueva España*, however, was not published until 1829, — three hundred years after his labors were begun, — its publication, even at this late day, being due to the historian Muñoz, who found a copy of Sahagun's manuscript in a convent at Tolosa. The friar expresses the belief that the first tribal immigration into Mexico was from the direction of Florida, or the northeast. From these tribes, he believes, were descended the Toltecs, celebrated for their artistic and professional abilities. Through their talent in these directions they acquired the designations Oxomoco, Cipactonal, Tlatetecuin, and Xochicauaca, all of which tends to the further belief that these people were the originators of the Mexican calendar. Sahagun also regarded the Tolteca as a part of or identical with the Chichimeca.

The deity Quetzalcoatl is said to have ruled the Toltecs peaceably; for them his reign formed the golden age. Teotihuacan, with its temples of the sun and moon, especially clings to his name. The name of Quetzalcoatl means, simply, "beautiful twin" according to Charencey, who also regards Chicomoztoc as a station of passage, not of origin, of the migrating Nahuas.

The innumerable city legends and Mexican tribal origins make of Sahagun's work a treasure of information which will require a long period for modern scientists to exhaust or even to compare with the results of historical research reached through other channels.

A. S. GATSCHET.

Codex Telleriano-Remensis. Manuscrit Mexicain du Cabinet de Ch.-M. le Tellier, Archevêque de Reims, à la Bibliothèque Nationale (MS. Mexicain, No. 385). Reproduit en photochromographie aux frais du Duc de Loubat et precédé d'une Introduction contenant la Transcription complète des Anciens Commentaires Hispano-Mexicains par le DR. E. T. HAMY. Paris: 1899. 4°, 47 pp., 50 pl.

In the year 1700 Charles Maurice le Tellier, archbishop of the diocese of Reims, donated fourteen ancient manuscripts to the Royal

(now National) Library at Paris, having previously been officially connected with that institution. This donation included Arabian, Hebrew, and other oriental writings of early origin, and also a Mexican codex known as the Codex Telleriano-Remensis. It is of large quarto size and contains fifty leaves of European paper, most of them inscribed on both sides. Judging from the water-mark it is assumed that this paper had been imported into Spain from Genoa, Italy. That which gives special value to the *Tellerianus* is the historical annotation in Spanish added to the colored Nahua pictographs which embellish every page and are intended to illustrate Mexican history in some of its more important details before and after the Spanish Conquest. The codex consists of three distinct portions, viz., (1) a calendar of stated days of ceremonial festivities, of which seven leaves are no longer extant; (2) a horoscopic volume, named *tonal-amatl*, of which seven leaves are also missing; and (3) a chronologic history of Mexican events.

The series of feast days in the existing portion of the codex begins with the seventh of the eighteen moons of the Nahuatl year; it was called *tecuil vitontl* and comprised the period equivalent to the end of our June and the beginning of July. A full list of the Nahua lunations or moons (of twenty days each) has been included (pages 7, 8) by the learned editor, Dr E. T. Hamy. The nemontomi or five intercalary days are inserted after the eighteenth moon.

The *tonalamatl* (*tonalli*, "sign of birth or nativity," and *amatl*, "paper") is divided into series of thirteen days each, thus forming a total of 360 days — five days less than the civil year. This curious monument of astrology is based wholly on superstition, but it gives an idea of the intellectual capacity of the people formerly inhabiting the central plains of Mexico.

The third portion, or chronologic history, is headed by the god Huitzilopochtli, represented as armed with reed-lances and ready for attack by a group of Indians dressed in skins of wild animals, and by a female figure called *Tonanicaca*, "our mother standing," as she is seen standing on the top of a hill. This personage is recognized as a common symbol of Aztlan, the mother country of the Nahua, a name which the historian Duran interprets "lugar de la blancura." Following is an enumeration of the towns and sites which the Nahua passed through on their celebrated migration from the northwest, all of them accompanied by the dates expressed in the calendar signs. The start was made from Aztlan in 1197, and the eight tribes which participated in the migration are given as Chichimeca, Nonoalco, Michihuaca, Cohuixca, Totonaca, Cuexteca, Olmeca, and Xicalanga. This list agrees pretty closely with

the one occurring in the parallel Codex Vaticanus, in which the tribes are represented as starting from the "seven caves." These names testify to the fact that at least four, if not five, racial and linguistic families of Mexico took part in the migration — the Nahua, Tarasco Totonaca, and Maya, the last mentioned being represented by the Huaxteca. From 1197 to 1562 all the events which appeared to be of importance were carefully recorded by the chronicler — royal successions, conquests, wars, comets, eclipses, etc. In spite of many lacunes in the supputation of the year, the Codex Tellerianus, with its perfectly legible Spanish handwriting, forms one of the most valuable records of early Mexican events that has been handed down from the sixteenth century. Students of Mexican hieroglyphics will not fail to express their gratitude to the Duc de Loubat for his continued generosity in making available these means of prosecuting their inquiries.

A. S. GATSCHET.

Ceremonial Deposits Found in an Ancient Pueblo Estufa in Northern New Mexico, U. S. A. By GEORGE H. PEPPER. New York: 1899. 4°, 6 pp., 1 pl., 6 figs.

This brochure is a reprint, in highly creditable style, of the author's paper in *Monumental Records*, and describes one of many important results of the Hyde Expedition which for several seasons has been conducting excavations for the American Museum of Natural History in the pueblo ruins of Chaco cañon, New Mexico, under the immediate direction of Mr Pepper.

Pueblo Bonito, which is the largest of nine great ruined towns in the cañon mentioned, measures about 300 by 550 feet, is semicircular in shape, and is surrounded by the remains of a massive wall which once enclosed the 500 rooms or more which formed this great communal structure. The pueblo contained two central courts or plazas, in the western one of which was exposed a circular kiva or council chamber, 25½ feet in diameter and constructed of faced blocks of sandstone. Excavation of the chamber revealed an adobe floor 15 feet beneath the surface, with the usual firebowl in the center. Surrounding the kiva wall was a bench 2 feet 2 inches wide by 2 feet high, built up across which, and at regular intervals, were six oblong masonry blocks or pillars. On the western side of the kiva, just before reaching the pillar level, a hollow clay cylinder, 6 inches in diameter, was found with the top broken in and the ends resting on two of the pillars, while on the bottom, and clinging to the inner face, were fibers and strips of bark which showed the former proximity of one of a series of logs, laid

horizontally in a circle, which supported the roof-beams in a manner similar to that employed in some of the still roofed kivas observed by Nordenskiöld in the Mesa Verde region. The removal of a circular adobe cap resting on one of the horizontal logs revealed a well-rounded cavity in which were deposited turquoise and shell beads, pieces of crude shell, and turquoise in the matrix. Examination of the roof-beams resting on each of the six supports on the kiva bench showed a similar log with its cavity containing an offering. These offerings Mr Pepper regards, and very reasonably, as a sacrificial deposit indicative of some ceremony connected with the construction of the kiva. The author calls attention to an interesting observation made by Dr Fewkes, who witnessed a house-dedication ceremony at one of the Hopi villages, noting that particles of food, shell fragments, and beads were deposited in a small cavity in the wall at the left of the doorway of the newly erected dwelling, which was then sealed with adobe.

There can be no doubt that as the researches of the Hyde Expedition continue in this fruitful field much knowledge will be gained concerning the culture of the Indians who built and occupied the cliff and valley dwellings of the cañon region of the Southwest, as well as the meaning of many of the surviving customs and rites among their living descendants. F. W. HODGE.

History of the New World Called America. By EDWARD JOHN PAYNE. Vol. II. Oxford: Clarendon press, 1899, 8°, xxviii., 604 pp.

This is a work of great learning and originality. Volume I, which was printed in 1892, devotes its first 268 pages, called Book I, to the preparation of the Old World to discover the New, the finding of which was only an episode in the universal scheme of exploration. Book II, extending without a break or rest from page 269 in volume I to page 604 in volume II, is devoted to aboriginal America preparing itself unconsciously through the ages to enter the arena of history.

The fundamental activity in all this was the food quest, which the author claims first to have brought into prominence; but in this he neglects Morgan and Ward. However, he does insist louder than any predecessor that the search for food, the preparation of food, the very acts and noises of the food getter and devourer are at the root of progress.

A branch of the human species wandered into the New World, like other animal species procreated on the soil of the Old World, when the two—afterward parted by a depression of the earth's crust and the formation of a shallow strait connecting the Arctic sea with the Pacific

ocean—were continuous. Driven about by the increasing ice-fields of successive glacial periods, this branch spread over the New World in all its parts, while it was distinguished from the inferior animals only by some painful and strenuous form of articulate speech, by the possession of rude stone implements, and by the possession of fire-sticks. In each continent after ages and ages of changes, only the last of which were visible at the Conquest, one stock reached higher progress—the Nahuatlaca and the Aymara-Quechua. The formation of the Warrior and the Peasant class, or the development of militarism and industrialism consentaneously through food industries, and the evolution of religion continue the discussion of the first volume. The unit of aboriginal life and history is the pueblo, and the highest result of progress the dominant pueblo. In the middle of a paragraph on page 61 the panorama changes to the discussion of Migration, on page 78 to the discussion of Ethnological Unity, and at the bottom of page 81 to American languages. This third treats of the origin of language as shown in the languages of America. The unit of significance is not the root, but the holophrase or "polysyllabic unit of utterance." Articulation is traced from the strenuous movements in the mastication and ingestion of foods, through increasing oralization, relaxation, and adjustments. These strenuous movements had their origin in the erect position of the *Anthropoidea*. If these two hundred pages were printed separately they would form a memorable volume on philology. Sixty pages are devoted to primitive mathematics, in which the vicenary system is specially emphasized. Here the author would be pleased to examine McGee's late study on "The Beginning of Mathematics." The relation of arithmetic to calendars and cycles and to games finds abundant illustration in American studies. The remainder of the volume, commencing on page 372, takes up, first, indigenous advancement, with patolli for a text, proceeds across the Miocene bridge, to discuss the spread of man over the New World, the paleo-ethnic small race, who first wandered from the Old World to the New (three of whose crania are said to be in the Peabody Museum, taken from the Trenton gravels), the Eskimo, the Athapascan, the Algonquian-Iroquois, the Nahuatlaca, and South American stocks and migrations. The Caribs are set forth with interesting originality and traced even into the Mississippi valley. The last hundred and fifty pages are devoted to Mexico and Peru, where the author is most at home and where he finds the best opportunity to demonstrate his theorem that the food quest overrides every other consideration in originating and developing human languages, industries, esthetic activities, social structures and functions, knowledges and religions.

In spite of the charming literary style, original suggestions, and great erudition displayed in this volume, we find it a difficult book to read. Instead of dividing it into chapters, the author has adopted the style of the double magic-lantern exhibition, in which, from beginning to finish, one picture fades from the screen and another takes its place without a break. The reader will acknowledge his obligation to the writer on every page for citations from old and rare books not within his reach, and if he misses any names it will be those of men now living and working. One regrets, for instance, to read hundreds of pages on ancient Mexico in which the name of Seler is wanting.

O. T. MASON.

PERIODICAL LITERATURE

General

Capitan (L.) La science préhistorique, ses méthodes. (Rev. de l'École d'Anthrop., Paris, Nov. 15, 1899, IX, 333-349.) The paper deals with the proper methods and utilization of other sciences in studies of the prehistoric; it should be read in extenso.—A. H.

Ethnographical collections in Germany. (Nature, Lond., Sept. 14, 1899, LX, 461-462.) Emphasizes the poverty of the collections in England by comparing them with those in Berlin.—R. B. D.

Holl (M.) Ueber die Lage des Ohres. (Mitth. d. Anthr. Ges. in Wien, 1899, XXIX, 171.) An examination of the correctness of the position of the ear in Egyptian (and classic) sculpture. The conclusions are that, in reference to the skull, the Egyptian sculptors placed the ear correctly; in reference to the face, the position of the ear seems abnormal, owing to a distortion of the features. This distortion consisted of an undue preponderance of the nasal over the lower region of the face, and was due to a desire to give the head the appearance of youth.—A. L. K.

Mahoudeau (Pierre G.) Les premières manifestations de la matière vivante. (Rev. de l'École d'Anthrop., Paris, Dec. 15, 1899, IX, 365-378.) The author reviews the main theories which have thus far been proposed to explain the appearance of life on the earth, and gives an extended notice to "Bathybius," the supposed most primitive living substance discovered. The conclusions of the erudite author are: "Life and motion are in reality one and the same phenomenon. Motion of extreme slowness suffices to the aggregations of inorganic molecules, while to the organic compounds of carbon a more rapid motion is necessary. The organic life is a very unstable, excessively rapid modification of the eternal motion of matter; it is the most delicate manifestation of that great universal life which commences at the atom of cosmic ether, to end, on this planet, in the superior being man."—A. H.

Temple (R. C.) Beginnings of currency. (Jour. Anthrop. Inst., Lond., 1899, II, 99-122.) A discussion of the evolution of currency from barter by a recognition of a certain staple article as standard of value. Often the standard of value loses its usefulness, or it may never have had such usefulness, and becomes purely a medium of exchange. The examples given in the paper are taken from the Far East, but the accompanying plates illustrate currency from all parts of the world.—F. B.

Thulié (Henri). Origine du mysticisme. (Revue de l'École d'Anthrop., Paris, Oct. 15, 1899, IX, 323-327.) The author attributes, as did Spinoza, the origin of mysticism to man's fears. Primitive man was exposed to many dangers and witnessed many inexplicable natural phenomena which sustained his fear and anguish. Night, lightning and thunder, and everything powerful or terrible, including dangerous animals and diseases, inspired terror and led primitive man to invoke the powers from which he suffered. Fire—precious, terrible, and unexplainable at the same time—became early the subject of cult. The fact that primitive man was everywhere exposed to radically the same dangers and witnessed similar natural phenomena, "explains the facts that all over the world, with all primitive people, we find the same superstitious procedures, nearly the same legends, deformed or transformed with transformation of the languages; and fundamentally the same cult, modified by surroundings and the level of knowledge. It is fear that is the starting-point of all those superstitions, mysticisms, and cults."

There are many long preserved traditions and usages among civilized peoples which are the remnants of their primitive mysticism.—A. H.

Vierkandt (A.) Die primitive Sittlichkeit der Naturvölker. (Globus, Braunschw., 1899, LXXVI, 149.) The morality of primitive man manifests itself

in the purity of sexual relations, hospitality, strength of social bonds among members of the community, and in their honesty. These phenomena are explained in several ways: Honesty is due to the fact that the publicity of life makes the concealment of theft, etc., impossible. The lack of strong competition between members of one community prevents the rise of struggles within the community. Uniformity in education and lack of intelligence and of a strong volition are considered further causes of the morality of primitive man.—F. B.

Ward (R. DeC.) Acclimatization of the white man in the tropics. (Bull. Am. Geog. Soc., N. Y., 1899, XXXI, 367-368.) Quotes various medical journals as upholding the theory that acclimatization is impossible.—R. B. D.

UNITED STATES AND CANADA

Beauchamp (W. M.) Archæology in New York. (Am. Antiquarian, Chicago, 1899, XXI, 315-316, 344-348.) Publications of the New York State University on local archeology.—H. I. S.

Blake (William P.) Aboriginal turquoise mining in Arizona and New Mexico. (Am. Antiquarian, Chicago, 1899, XXI, 278-284.) The use of turquoise is considered evidence of the racial unity of the prehistoric occupants of this region. The identity of chalchuite and turquoise discussed. An old shaft and a stone hammer, found near by, are illustrated.—H. I. S.

Dennis (Alfred Pearce). Life on a Yukon trail. (Nat. Geog. Mag., Wash., 1899, X, 377-391, 457-466.) Several pages are devoted to a popular description of the Indians ("Tahltan") of the region.—H. I. S.

Gatschet (A. S.) Water-monsters of American aborigines. (Jour. Am. Folk-Lore, Boston, 1899, XII, 255-260.) Aquatic monsters are found in the folklore of every people. Among the American Indians the monsters have in themselves more of animal than of human characteristics, and these appear usually in an exaggerated form. The horned snail, snakes, tigers, fish, etc., figure among these monsters.—H. I. S.

Henning (Ch. L.) Die Onondaga-Indianer des Staates New York. (Globus, Braunschw., 1899, LXXVI, 198, 222.) Information on the Onondaga reservation and traditional material obtained from Daniel La Fort and Albert Cusick, with references to older literature. The author reports that the clan organization is said to have been instituted by Hiawatha.—F. B.

Horsford (Cornelia). Vinland and its ruins. Some of the evidences that Northmen were in Massachusetts in pre-Columbian days. (Appleton's Pop. Sci. Monthly, Dec., 1899; also reprint.) The author adduces strong evidence to show that on "the only point of land on the coast of North America [i. e., the vicinity of the mouth of Charles river, Mass.] which we have found to correspond with the description of the site of Thorfinn Karlsefni's houses, ruins have been dug out which bear peculiar features characteristic of the period in Iceland known as the Saga-time, and differing in certain essential features from the handiwork of all the native races of North America, and, as far as is known at present, from all other races in Europe or in America in post-Columbian days."—F. W. H.

Kroeber (A. L.) Tales of the Smith Sound Eskimo. (Jour. Am. Folk-Lore, Boston, 1899, XII, 166-182.) Tales collected in 1897-98 in New York City from visiting Eskimo. Similarities with the tales of other Eskimo tribes are pointed out.—H. I. S.

Lummis (C. F.) My brother's keeper I-V. (Land of Sunshine, Los Angeles, Aug.-Dec., 1899.) A stringent criticism of the policy of the government toward the Indians, especially in regard to the methods of educating Indian children, based mainly on personal observation among the Pueblos.—A. S. G.

Meredith (H. C.) Aboriginal art in obsidian. (Land of Sunshine, Los Angeles, 1899, XI, 255-258.) A brief description of a collection of obsidian implements found in California and attributed to the "Digger" Indians. Some are of sickle shape, which, the editor explains, is due to the character of the material rather than to special effort in thus flaking it.—F. W. H.

Peet (S. D.) The cliff-dwellers and the wild tribes. (Am. Antiquarian, Chi-

cago, 1899, XXI, 349–368.) The author attempts to show the main points of difference between the wild tribes of the Southwest and the Pueblos and their cliff-dwelling ancestors. The paper is based solely on the work of others, without regard to its good, bad, or indifferent character; it contains nothing new, but much that is erroneous. Those who scan the illustrations (all of which have been used before) will recognize Dr Fewkes' portrait of the "Chief of the Antelope Priests" at Moki now doing service as a "Navajo priest."—F. W. H.

—— The beginnings of pueblo architecture. (Am. Antiquarian, Chicago, 1899, XXI, 317–328.) An illustrated editorial containing long quotations mainly from Mindeleff—H. I. S.

—— Prehistoric irrigation. (Am. Antiquarian, Chicago, 1899, XXI, 285–308.) The social condition of the Pueblos is connected with irrigation; methods of storing water and of irrigating are touched upon and the distribution of ditches is mentioned. The author believes the ditches are older than has been supposed; their builders were agricultural people, under a village government, who changed from savage and nomadic life at a very early time and before the present geological conditions in that region.—H. I. S.

Putnam (F. W.) A problem in American anthropology. (Science, N. Y., Aug. 25, 1899. X, 225-236; Nature, Lond., Sept. 7, 1899, LX, 451–455.) In his address as retiring president of the American Association for the Advancement of Science, Professor Putnam reviews the development of the different theories as to the origin and unity of the American Indians. He considers that from cranial and other evidence several groups or types may be distinguished, and endorses the view that the American Indian does not constitute a homogeneous race. Both Eurafrican and Asiatic origins for these types are suggested. The Mound-builders are regarded as related to the ancient Mexicans, the relationship being traced largely through the art and symbolism of the two peoples.—R. B. D.

Webber (Ellen R. C.) An old Kwanthum village—its people and its fall. (Am. Antiquarian, Chicago, 1899, XXI, 309-314.) A description of the shell-heap at Port Hammond, B. C., based on but little exploration. With it is given a legend, some details of which are incorrect, and ethnological notes from Port Hammond and the interior of B. C. All is woven into a history of the shell-heap for which the author has well disclaimed responsibility.—H. I. S.

Wickersham (Jas.) Notes on the Indians of Washington. (Am. Antiquarian, Chicago, 1899, XXI, 369–375.) The Washington State Philological Society is organized to include the study and recording of the Indian languages of the state.—H. I. S.

MEXICO AND CENTRAL AMERICA

Corner (Wm.) Mitla: an archæological study of the ancient ruins and remains in that pueblo. (Jour. Anth. Inst., Lond., 1899, II, 29-50.) The various ruins at Mitla are described from personal observation and are illustrated by seven plates and ten text figures. Discussions of a theoretical nature by Mr Maudslay and Col. Geo. Carl Church follow.—J. R. S.

Förstemann (E.) Drei Inschriften von Palenque. (Globus, Braunschw., 1899, LXXVI, 176.) Proof that the inscriptions in the three temples of Palenque are closely related.—F. B.

Starr (Frederick). Holy Week in Mexico. (Jour. Am. Folk-Lore, Boston, 1899, XII, 161–165.) Some elements which enter into Holy Week celebration in Mexico are found in every Catholic land; some are simply Spanish, but others are peculiar to Mexico.—H. I. S.

SOUTH AMERICA

Berlin (A. F.) Terra-cotta antiquities from the land of the Incas. (Am. Antiquarian, Chicago, 1899, XXI, 271-277.) Description of pottery, dishes, stamps, etc., in the collection of the late Dr T. W. Detwiller, of Bethlehem, Penn.—H. I. S.

Moreno (F. P.) Explorations in Patagonia. (Geog. Journ., Lond., 1899, XIV, 242-269, 353-373.) Although primarily geological and geographical in its nature, Dr Moreno's paper deals incidentally with archeological matters.

The remains of the now extinct races in this region are said to resemble those of the Chaco and Brazil; some remains were found differing from all others as yet discovered in South America. Cranial deformation of all types was noticed.—R. B. D.

ASIA

de Barthelmy (*Comte*). Au pays des Möis. (Bull. Soc. Géog. de Paris, 1899, 7e sér., XX, 330–343.) The term "Möis" means merely "savage," hence many different tribes are confounded under one name. Two of these tribes, the Daviats and the Sedangs, are referred to, the former building their villages in the open and fortifying them, the latter concealing their small towns in the depths of the forest.—R. B. D.

Bastian (A.) Mittheilungen von einer Reise nach Niederländisch-Indien. (Verh. d. Berl. Ges. für Anth., Ethn., u. Urgesch., 1899, XXXI, 420.) Deals with the Mohammedan, Hindu, and fetishistic elements of Javan religion. —A. L. K.

Carey (F. W.) A trip to the Chinese Shan states. (Geog. Journ., London, 1899, XIV, 378–394.) A brief account of the Shans is given, and reference made to the Akkas and Loles, two tribes differing in some respect from the Shans.—R. B. D.

Collineau (*Dr*). L'infanticide et l'avortement en Chine. (Revue d. l'École d'Anthrop., Paris, Nov. 15, 1899, IX, 350–353.) These observations proceed from Dr Matignon, of the French Legation at Peking. Infanticide and abortion in China, according to these reliable observations, are not so common as reported by some authors, nevertheless they are frequent and are practiced with "more cynicism" than in other countries. Means to prevent conception or to produce abortion are openly and undisguisedly advertised. The most frequent causes of these practices are poverty and all forms of superstition. A daughter is considered "a merchandise from which one cannot relieve himself except at a loss," which sentiment favors female infanticide. In certain localities the girls are preserved only because they may once possibly become a source of revenue by being sold into prostitution. The author enumerates the main causes of infanticide connected with dogma and superstition; again female infants are at a disadvantage. The death of the infant is decided by the family; methods of death differ, but drowning of some sort and exposure to cold predominate. —A. H.

Duckworth (W. L. H.) Note on a skull from Syria. (Jour. Anth. Inst., Lond., 1899, II, 145–151.) The subject of this sketch was "picked up" near Damascus after the massacres of 1860. After comparing it with other skulls from the same region the author seems inclined to regard it as from an individual who if not a Turk at least had Turkish blood.—J. R. S.

Holdich (T. H.) Swatis and Afridis. (Jour. Anth. Inst., Lond., 1899, II, 2–9.) The ruling class among the Swatis are Afghans, and they have been subjected by the successive rulers of the Punjab; the Afridis are of Indian origin, living from remote times in isolated independence. They are divided into bands, but there is scarcely any more centralized form of government in each than the paternal. They are characterized as treacherous, cruel, and regardless of family ties, but, on the other hand, brave, intelligent, and respecters of civilized methods of warfare.—J. R. S.

—— The Arab tribes of our Indian frontier. (Jour. Anth. Inst., Lond., 1899, II, 10–19.) This paper is supplementary to the preceding, taking in the southern section of the northwestern border of India. In spite of the barrenness of the country, Baloochistan, lying on the high road between Persia and India, has been traversed and occupied by innumerable peoples from early times. Remnants of a very large number of these are still in the country. Most prominent are the Brahuis in the west and the Baluch in the east which the author classes as Dravidian and Arabian respectively. In character, especially in the absence of fanaticism, the Baluch compare favorably with the northern tribes. In the discussion which this paper called forth, an Aryan origin of the Baluch was advocated rather than an Arabian origin.—J. R. S.

Karsten (Paula). Kinder und Kinderspiele der Inder und Singhalesen.

(Globus, Braunschw., 1899, LXXVI, 213, 234.) Observations on a visiting troupe of natives of India in regard to the treatment of infants, early marriages, and children's games.—F. B.

Klementz (D.) Voyages de Dmitri Klementz en Mongolie Occidentale. (Bull. Soc. Géog. Paris, 1899, 7e sér., XX, 308–329.) A brief account of the explorations of the author from 1885 to 1897, apparently as a member of the Prjevalsky expedition. The Soïots of the Saïan mountains, a people related to the Samoyeds but long under Turkish influence, are described; some details in regard to the Buriats are also given. Ruins and inscriptions, the work of an earlier population, were found throughout the area.—R. B. D.

Olssufjev (A. W.) Der Anadyr-Bezirk nach A. W. Olssufjev. Trans. by D. Krahmer. (Peterm. Mitt., Gotha, 1899, XLV, 29–37, 228–235, 261–268.) In the second of these three articles the Chukchi are described in some detail. Their division into groups, their physical characters, dress, social organization, and mode of life are taken up in succession. The Lamuts, as the Tunguse are called in this region, differ from the Chukchi very considerably, are inferior to them in physical development, and are hunters and not pastoral or settled people as are the Chukchi.—R. B. D.

Preuss (K. Th.) Die Zauber-Muster der Ôrang Sĕmang in Malâka. Nach den Materialien von H. V. Stevens. (Zeitshr. für Ethn., Berlin, 1899, XXXI, 137.) A continuation of the investigation begun by A. Grünwedel in vol. XXV of the same journal. The designs, or pictographs, which are supposed to avert disease by magic, are cut into bamboo combs or sticks and carried on the person. Each design prevents a malady and seems to consist chiefly of the symbol of that disease and the symbol of a flower having magic power. The system is highly developed and complex, and not yet altogether clear.—A. L. K.

Rösler (E.) Ausgrabungen in Transkaukasien. (Verh. d. Berl. Ges. für Anthr., Ethn., u. Urgesch., 1899, XXXI, 243.) Some of the finds give evidence of an advanced state of technology.—A. L. K.

Schumacher (Rob.) Eine Reise zu den Tschin-huan in Formosa. (Globus, Braunschw., 1899, LXXVI, 217.) Description of a visit to the mountain tribes of Formosa, with sketches of implements.—F. B.

von Stenin (P.) Jochelsons Forschungen unter den Jukagiren. (Globus, Braunschw., 1899, LXXVI, 166.) A brief summary of W. Jochelson's important investigations on the Yukagheer. Report on the traditions, customs, and social organization of this tribe. They had no chiefs. Forms of respectful address, like those present in other Asiatic languages, occur. Women erect the tent, carry game home, and do household work. The armor, which is made of rods of reindeer antlers, is decorated. Tribal feuds were often settled by duels between prominent men. Two interesting pictographs (charts) accompany the paper.—F. B.

Turley (R. T.) Through the Hun Kiang gorges; or notes of a tour in No Man's Land, Manchuria. (Geog. Journ., Lond., 1899, XIV, 292-302.) Contains a few details as to the distribution of the Koreans and Chinese in this region, the susceptibility of the latter to fevers, and their organization into guilds.—R. B. D.

AUSTRALIA AND PACIFIC ISLANDS

von Bülow (W.) Beiträge zur Ethnographie der Samoa-Inseln. (Int. Archiv f. Ethnog., Leiden, 1899, XII, 129–145):

III, Das Handwerkszeug des Tatuirer's. Brief description of implements and methods of Samoan tattooing.

IV, Die Taube in den Sprachbildern der Samoaner. Account of peculiar influences of the dove, dove hunting, etc., upon the vocabulary, particularly in modifying the so-called 'Häuptlings sprache' as distinguished from the vernacular. The fact that the dove is but slightly concerned in the religious myths may account for its selection.

V, Ie toga (Heilige Matten). Describes hand-plaited mats used as sacred offerings and on ceremonial occasions. Regarded as gifts of the gods. Tradition to that effect is given in Samoan with German translation.

VI, Der Ursprung des Aitu Moso. Tradition in Samoan with German translation.—L. F.

Karutz (*Dr*) Drei Knochengeräthe von den Anachoreten. (Int. Archiv. f. Ethn., Leiden, 1899, XII, 146-148.) Description and discussion of bone implements in the Lubeck Museum.

von Luschan (F.) Neue Beiträge zur Ethnographie der Matty-Insel. (Int. Archiv f. Ethn., Leiden, 1899, XII, 121–128.) A brief report of observations and collections made during a visit in 1897 of the German man-of-war *Falke* to Matty island, off the coast of New Guinea. Weapons and utensils are described, and a photograph and drawings of a characteristic and very interesting form of native canoe are given. No physical measurements nor linguistic results. Question of stock relationship remains unsolved.—L. F.

Perkins (Herbert). Some Australian tree carvings. (Jour. Anthr. Inst., Lond., 1899, II, 152.) These tree carvings are preserved in the Australian Museum at Sydney. It was thought that they might refer in some way to the boomerang, or have been set to mark the graves of certain prominent men, but the author suggests that they had some connection with the "Bora" rites of initiation to manhood. All are said to come from one district of central New South Wales, west of the mountains. The paper is illustrated.—J. R. S.

Roth (H. Ling). Cave shelters and the aborigines of Tasmania. (Nature, Lond., Oct. 5, 1899, LX, 545.) Note on the discovery of a cave shelter near Hobart.—R. B. D.

AFRICA

Bennett (Albert L.) Ethnographical notes on the Fang. (Jour. Anthr. Inst., Lond., 1899, II, 66–97, 3 pl.) A very complete anthropological account of this West African tribe by one long resident among them. It is especially full in the sections devoted to fetishes and religious rites, and contains some material regarding the "African pygmies."—J. R. S.

de Cardi (*Comte* C. N.) Ju-ju laws and customs in the Niger delta. (Journ. Anthr. Inst., London, 1899, II, 51–63.) The account of customs and rites given under this head are from one who has had long and direct experience with the natives of the region indicated. The chief headings in the paper are "Jujuism," "Native curse-words and sticks," "Clitoridectomy." In the "discussion" following Miss Kingsley furnishes much information regarding the social organization of the Kru. The text is illustrated by two plates and supplemented by four reproductions from photographs of Sherbro, west coast of Africa.—J. R. S.

Dorsey (G. A.) The ocimbanda, or witch-doctor of the Ovimbundu of Portuguese Southwest Africa. (Jour. Am. Folk-Lore, Boston, 1899, XII, 183–188.) Description of a complete "medicine chest" of a witch-doctor.—H. I. S.

Hutter. Politische und sociale Verhältnisse bei den Graslandstämmen Nordkameruns. (Globus, Braunschw., 1899, LXXVI, 284, 303.) Description of the political organization and methods of warfare, trade, and laws of the tribes northeast of Cameroon.—F. B.

Marriott (H. P. Fitzgerald). The secret societies of West Africa. (Jour. Anth. Inst., Lond., 1899, II, 21–27.) This is an abstract only, and the facts contained were drawn principally from sources beyond the author's immediate experience. The compilation bears upon a very important phase of African culture in the region west of the Niger. —J. R. S.

EUROPE

Bünker (J. R.) Das siebenbürgisch-sächsische Bauernhaus. (Mitth. d. Anthr. Ges. in Wien, 1899, XXIX, 191.) A contention that the German peasant house of Transylvania is typically Aryan and not of specifically South German origin.—A. L. K.

Ella (Samuel). Dialect changes in the Polynesian languages. (Jour. Anthrop. Inst., Lond., 1899, II, 154–180.) A concise and apparently full summary of phonetic changes among the various Polynesian dialects is given, followed by a brief account of the grammar and a comparative list of several common Polynesian words. The author has had long experience among the peoples speaking these dialects, especially in the Samoan group.—J. R. S.

Český Lid [a Czech journal devoted to Czech and Slavonic folklore and ethnology, Ed. B. Niederle, director

Czech Ethnolog. Museum, Prague, Bohemia], vol. IX, Prague, 1899. This volume contains a large number of interesting smaller contributions to Czech and Slavonic folklore, ethnology, and archeology. O. Fisch and F. J. Čečetka contribute to the history of vassalage in Bohemia. O. Malec, A. Hlavinka, and Č. Zíbrt describe the picturesque costumes worn by the common people in certain districts of Bohemia and Moravia. Papers by F. Kretz and R. Tyršova deal respectively with the subjects of lace making and embroidery among the common people. Dušan Jurkovič describes the painting of certain external parts of the houses in Valachia, while V. Hauer gives the nomenclature of various parts of the house in Silesia. Dances and songs of the people are the subjects of the communications of A. Alavinka, J. Š. Baar, J. L. Holub, J. Vluka, K. V. Adámek, L. Quis; while some tales, collected among common people, are given by I. Hošek and F. V. Bouchal. C. Zíbrt continues his effort toward explaining the superstitions among the Czecho-Slavonic peoples at the end of last and the beginning of this century. Č. Holas writes about "traditional literature." F. Krétz contributes to the history of a certain type of pottery in Slavonia. Mushrooms in western Moravian folklore is the title of a paper by F. Šilhavý. J. V. Neudoerfel describes an interesting custom among the common people of the Chotěboř district. The day consecrated in the calendar to Sta Katharina is a "ladies' day." The women prepare an elaborate feast for the occasion, which is participated in mainly by married people. The wife on this day assumes the role and the rights of her husband, and vice versa. There is a dance in the evening, and the women continue in the masculine role by choosing the partners, paying the musicians, ordering the "solos," etc. The men submit cheerfully to their feminine role. This performance ends at midnight with a grand supper, after which a regular dance, in which the unmarried also participate, is conducted. K. Lábler reports some curious municipal rules, from the year 1582, in Brandejs nad Labem. Finally, J. Vyhlidal writes about the life of Silesian children, describing certain of their customs, ditties, calls, etc.

The numerous contributors of Český Lid are mainly teachers, physicians, and other more or less scientific men, who are in direct contact with the common people. Of Czecho-Slavonic folklore, songs, dances, and customs there is almost no end, and they differ more or less in every district and almost in every old village.—A. H.

Kaindl (Raimund F.) Zauberglaube bei den Huzulen. (Globus, Braunschwg., 1899, LXXVI, 229, 252.) Kaindl published a description of the beliefs of the Ruthenians on witchcraft in *Globus*, vols. 61 and 71. The beliefs of the Huzuls, the Ruthenians of the mountains, are described in the present paper. Most sorcery is believed to be accomplished with the help of the devil; but other means are also available. The belief in vampires is current. Some tales regarding vampires and witches are given. Certain people are able to exert supernatural control over the weather. Hail and storms are believed to be the work of the devil. Cattle may be bewitched and protected or cured by supernatural means. Sickness is cured in the same way. The author also describes philters, beliefs in regard to fishing, hunting, etc.—F. B.

Ohnefalsch-Richter (M.) Neues über die auf Cypern angestellten Ausgrabungen. (Verh. d. Berl. Ges. für Anthr., Ethn., u. Urgesch., 1899, XXXI, 298.) The author continues his report of the results of excavations, and concludes by tracing the development of Cyprian culture and emphasizing the importance of the island as the chief ancient point of communication of Orient and Occident.—A. L. K.

Read (C. H.) Presidential address. Section H, British Association for the Advancement of Science. (Nature, Lond., Oct. 5, 1899, LX, 554–557.) Treats of the necessity of expert as against amateur investigation of archeologic remains in England, and urges the prosecution of anthropologic work in the British Empire on the scale that it is being carried on in Germany.—R. B. D.

Tetzner (F.) Die Philipponen in Ostpreussen. (Globus, Braunschw., 1899, LXXVI, 181–192.) Description of the history and customs of the descendants of a Russian sect in eastern Prussia.—F. B.

NOTES AND NEWS

The International Congresses.—As announced in the last issue of this journal the fourth INTERNATIONAL CONGRESS OF PSYCHOLOGY will be held under the patronage of the French government in the Palais des Congrès of the Paris Exposition, August 20th to 25th. The first international reunion of psychologists was held during the Paris Exposition of 1889, and resulted in periodical meetings with a permanent organization. The second congress met in London in 1892, and the third, which arranged the organization of the coming meeting, in Munich in 1896. The congress appeals to all who may be interested in the study of the human mind. The president of the committee is Prof. Th. Ribot, the vice-president Dr Charles Richet, and the secretary Dr Pierre Janet, while of the seven sections of the congress Professor Delage is chairman of the section of animal and comparative psychology, anthropology, and ethnology.

The twelfth INTERNATIONAL CONGRESS OF PREHISTORIC ANTHROPOLOGY AND ARCHEOLOGY will be held in the Palais des Congrès, August 20th to 25th, the meetings being synchronous with those of the Congress of Psychology. The committee of organization is an unusually strong one, consisting of thirty-one of the most prominent anthropologists in France. Its officers are M. Alexandre Bertrand, president; M. Albert Gaudry and Dr E. T. Hamy, vice-presidents; Dr R. Verneau, general secretary; Dr G. Papillault, secretary; M. Henri Herbert (74 rue Claude-Bernard), treasurer. The membership fee is fifteen francs.

The INTERNATIONAL CONGRESS OF ETHNOGRAPHIC SCIENCES will hold its third session in the Palais des Congrès, August 26th to September 1st. The committee of organization are: President, M. Maurice Block, president of the Société d'Ethnographie; first vice-president, M. le Baron Textor de Ravisi; vice-presidents, MM. Boban-Duverger, Gauttard, Greverath, and Léon de Rosny; general secretary, M. Georges Raynaud; secretaries, MM. René Allain, Laporte, Pouvrier, and Thomas; treasurer, M. Leclère. American ethnologists proposing to attend the meetings of the congress or contemplating the presentation of papers should communicate as soon as practicable with M. Boban-Duverger, 18 rue Thibaud, or with the general secretary at 82 rue

Mouffetard. The membership fee is 12 francs. The congress will comprise seven sections, as follows: I, General ethnology; II, sociology, ethics; III, ethnographic psychology; IV, science of religion; V, linguistics and paleography; VI, arts and industries; VII, descriptive ethnography.

The INTERNATIONAL FOLKLORE CONGRESS will hold its session at the Palais des Congrès, September 10–12, the general subjects to be discussed being classed under the sections Oral literature and popular art, and Traditional ethnography. The membership fee is 12 francs. Although French has been designated as the official language of the congress, papers may be presented also in German, English, Italian, and Latin, in which latter event they must be accompanied by a résumé in French, and should be in the hands of the secretary by July 1st. The committee of organization consists of M. Gaston Paris, honorary president; M. Charles Beauquier, president, MM. J. F. Bladé, Loys Brueyre, and Eugène Müntz, vice-presidents; M. Paul Sébillot (80 Boulevard Saint-Marcel), general secretary; MM. Émile Blémont, George Doncieux, and Raoul Rosières, secretaries; M. A. Certeux, treasurer.

No meetings of greater interest to American anthropologists will be held during the exposition than those of the twelfth INTERNATIONAL CONGRESS OF AMERICANISTS, which also will be held under the patronage of the French government, the session beginning September 17th. The committee of organization has been selected from the Société des Américanistes de Paris, in accordance with the decision of the last congress. The president is Professor Hamy, with Prince Roland Bonaparte and the Marquis de Nadaillac as vice-presidents. Among the members of the committee are Baron de Baye, M. Desiré Charnay, Professor Lavasseur, M. le Duc de Loubat (who has been so instrumental in advancing the interests of American anthropology), MM. Maspero, Oppert, and Rosny, and Mr Henry Vignaud of the United States Embassy at Paris. The general secretary is M. Henri Froidevaux, 12 rue Notre-Dame-des-Champs; the treasurer, M. Jules Hebert, Musée d'Ethnographie du Trocadero, Paris. The object of the International Congress of Americanists is to contribute to the progress of scientific research concerning the Western Hemisphere, especially for the periods preceding and immediately following the discovery. Any person interested in the subject may become a member on payment of the subscription of 15 francs. The work of the congress has been divided into four sections, embracing practically every phase of American archeology, ethnology, and early history, as follows: 1, History and geography; 2, anthropology and ethnology; 3, archeology; 4, linguistics and paleography. Memoirs

requiring more than fifteen minutes for reading will be presented only by abstract and in French. Papers by persons unable to be present should be in the hands of the secretary before September 1st.

It is hoped that American students will be well represented at the various congresses either in person or by papers. The latter will be published, with illustrations when necessary, in the reports of the respective congresses, which are sent free to members.

Mexicans and Fatalism.— In nothing, perhaps, are the Mexican inhabitants of southwestern United States more markedly peculiar than in their fatalism. "God has so willed it; so may it be," is one of their commonest aphorisms — the idea upon which the most trivial actions of their lives appear to be based.

The town of Socorro, situated on the Rio Grande, 75 miles south of Albuquerque, New Mexico, had suffered terribly from floods which, in the rainy season, were carried from the mountains by arroyos passing directly through the town. On examination it was discovered that by a small expenditure of money two miles above the place, the waters could be diverted, thereby making life and property perfectly safe. Don Camilio Baca, a large property-holder, when approached in regard to a subscription for the purpose of carrying out this work, replied, "God placed the arroyo there, and there is where I want it to stay." And this, too, in spite of the fact that his own house had been washed down in a recent flood.

The smallpox may be raging in its most virulent form, but the Mexicans — so far from seeking to avoid it — will take their children with them when they visit a house in which it is present. An American who was once taken care of in the house of a Mexican (by the way, the Spanish language has no word for home) while suffering severely from smallpox, told me that the women would bring their babies and lay them on his bed in order that they might contract the disease. This was done with a twofold purpose — that the children might have it when small (at which time they think it less likely to prove fatal), and that the parents might not be put to the trouble of rearing their children only to have them die after all. And yet, as parents, they are ordinarily most kind and pleasant, this apparent hard-heartedness being merely a reflection of their fatalism. Living as they have for generations in usually floorless, insanitary houses, generally crowded closely together even in the small towns, formerly without medical assistance being obtainable, has tended to foster the idea of submitting to what they imagine is "God's will."

I know of one little town that lost thirty-eight of its forty-five children

at one visitation of smallpox — nearly all under twelve years of age — that length of time having elapsed since the last scourge had swept over them. The disease in this case was particularly fatal, but even in this instance there was an acquiescence unknown to people of Anglo-Saxon derivation. In many of these cases, no doubt, the children would not have contracted the disease had they not been purposely exposed to it. The Mexicans who live in or near American towns, or towns in which the American population predominates, have, of course, learned more of modern thought in regard to such things than have those of the more isolated villages, or the rural folk.

This fatalism, while producing many serious results, has still its redeeming features. It leads to a certain contentedness, a sort of placid cheerfulness, that is somewhat of a relief to the insistent American strenuousness that will not down.

While the ordinary Mexican has a roof to shelter himself and family,— no matter how humble his abode may be,— and a little food in the house, he seems to be perfectly happy. Life, to him, is not a perpetual battle of acquisition. He is as happy over his pot of beans and chile, with the inevitable tortilla, as a crowned king.

When a member of a family dies, one or two days will be given up to mourning, after which they appear entirely reconciled to the new conditions and all vain regrets are banished. I have heard but once of any violent or dangerous outburst caused by grief at the death of a relation. In this instance a physician had been called to attend a young man, bedridden with a long-neglected case of diphtheria. After taking some medicine, the patient appeared to grow much better, and getting out of bed, bade his people good-bye. He then lay down again and was dead within fifteen minutes. The old father, frantic with grief, obtained a knife and was prevented only by force from attacking the doctor.

The men are usually kind and affectionate husbands; but very seldom does it happen when a woman dies that her husband remains single for a long time; indeed many are married within six weeks or three months. Fatalism includes in its list of attributes not only the art of expecting and submitting, but also that of forgetting.

U. Francis Duff.

Polynesian Ethnology.— In a recent letter to Mr William H. Babcock of Washington, Mr Edward Tregear, the well-known ethnologist of Wellington, New Zealand, writes as follows regarding the natives of that and other islands of Polynesia:

"The only people of New Zealand who can be called mountaineers

are the Uruwera of the eastern coast. Do I consider these mountaineers and the Moriori of the same race? Well, no, only as branches of the Polynesian race, just as Maoris and Tahitians are the same people. The Moriori were a peaceful, quiet people, almost without weapons, untattooed, with their language full of queer sounds. The Uruwera, on the contrary, were a very warlike and grim people, apparently of real New Zealand stock. Our best authorities consider them 'the people of the land,' who were here centuries at least before canoes came from Hawaiki five hundred years ago. They claim to be autochthonous, but that is doubtful, for they have the regular Polynesian legends born in far other lands than these. There is absolutely no sign that New Zealand was occupied by a dark — a Negrito — people. The Uruwera have among them many people with fair hair and blue eyes (with no possibility of European cross), so that by the other Maori they are called 'Fair-haired.' The fairies of the Maori are also said to have fair hair and blue eyes, so that the elves-and-gnomes theory would be untenable here if the prior inhabitants had been short and swarthy like the Andaman and Nicobar islanders. I must mention, however, that the Maori recognize some short, dark fairies — the *turehu*.

"I believe that the Maori darkened in this way: Their canoes, as they passed eastward from India, were full of bold and warlike explorers, with few if any women. As they reached the Malay islands they stopped to plant food. Their yams and taro grown, they started again, perhaps in a year, perhaps not for a century; but wherever they stopped they took the women of the land as wives. Alfuros then, the Malays had not come down from southeastern Asia. Then on to Papua, to the New Hebrides, New Britain, New Caledonia, Fiji,— always black wives, always darkening from the original Aryan type.

"If by Maoris one means the 'Norman invasion' from Hawaiki five hundred years ago, there were certainly people here before them. There are forts in New Zealand of almost that age, with giant trees growing from their earthworks, one of the latter being three miles in length. Ten thousand men could hardly defend such a wall. There are parts of the country where forty great forts may be counted at once. The country must have swarmed with people, and all these had to descend from a handful of canoemen and three or four women. Moreover, their legends tell of fierce battles which were fought soon after landing. But whether these inhabitants were Papuans or a prior migration of Polynesians cannot be determined.

"The Uruwera are the same in appearance as other New Zealand

peoples if we except the occasional light hair. They are utterly unlike the Negrito or Papuan, they have no tint or shade of that dusky black under the skin that marks the Hindoo people, nor of the 'blue black' of the Fijian and Melanesian. They do not differ in stature, appearance, tattooing, or anything else from the true Maori, except that, owing to their isolation, they have kept their native bearing and ancient customs in greater purity.

"I have not observed much difference between the Moriori and the Maori. Most of the Moriori had Jewish noses; Tapu, their priest-chief, had a most tremendous Jewish nose. Their language is, I think, a subdialect of Maori, but with queer variations. Strangely enough they have the Eastern causative. A causative prefix *whaka*, or *faka*, is applied to verbs in New Zealand, Tonga, Samoa, and West Polynesia—*haere*, to go; *whaka haere*, to cause to go; *takoto*, to lie down; *whaka takoto*, to lay down. In the east — Hawaii, the Marquesas, etc.— the natives use *hoko* or *hoo* for *whaka*, and this the Maori also do.

"I have visited the Chatham islanders and talked with their oldest priest, noting their genealogies, legends, etc. Mr W. A. Shand, a native interpreter at the Chathams, was born among them and is the only man who thoroughly understands that curious and nearly extinct people, their language, religion, etc. He has published, in parts, in the *Polynesian Journal*, a complete history and description of the Moriori, giving the legends in their dialect, their songs, etc."

Divisions of Some West Australian Tribes.—In an article contributed in 1898 to the American Philosophical Society, I described the eight intermarrying divisions of the Wom-by-a tribe, occupying the Cresswell Downs station and surrounding country. In that paper it was stated that this eight-section system extended from the boundary of Queensland to that of West Australia, and that it was in force over the greater part of the Northern Territory, a name given to the northern portion of South Australia.[1] Later in the year I ascertained that eight analogous sections, with slight variations in the names, existed among native tribes in the northwestern corner of Queensland. The names of these eight sections, with the order of their intermarriage and the descent of the offspring, are fully detailed in an article published in the July, 1899, issue of this journal.

More recently it has been my good fortune to obtain reliable particulars of a similar eight-section system among some large and important tribes in West Australia. The tribes dealt with inhabit the

[1] *Divisions of Australian Tribes;* Proc. Amer. Philos. Soc., Phila., vol. XXXVII, pp. 131–154.

country from Cambridge gulf southward for about 300 miles and extending westwardly from the boundary between the Northern Territory and West Australia for a hundred miles or more. This immense area includes the country drained by Ord, Denham, King, Forrest, and other rivers, Stirling creek, Sturt creek, Margaret river, and down Fitzroy river from its source to Minnie Pool, or farther westward. Some of the best known of the tribes within the geographic limits mentioned are the Lunga, Keha, Perrakee, Mayu, Goonien, Nigena, Booneba, Jarrou, and Wolmaharry. The nomenclature of the eight sections in use among these tribes, their laws of intermarriage, and the designation of the children will readily be understood by an examination of the following table:

PHRATRY	PARENTS		CHILDREN	
	FATHER	MOTHER	SON	DAUGHTER
A	Jungurra	Nungulla	Jabulgie	Nabijerry
	Jackara	Nabijerry	Julimar	Naboron
	Janima	Naboron	Jungary	Nabungarty
	Jambidgena	Nabungarty	Jangula	Nungulla
B	Jangula	Nangilee	Jambidgena	Nambidgena
	Jungary	Nambidgena	Janima	Nabina
	Julimar	Nabanna	Jackara	Nackara
	Jabulgie	Nackara	Jungurra	Nangilee

As hitherto explained in dealing with similar organizations among the tribes of the Northern Territory and Queensland, the community is segregated into two phratries, each of which is subdivided into four sections. Each phratry has perpetual succession, or is maintained intact, by means of its women. For example, the daughter belongs to the same phratry as her mother, but to a different section. Taking the genealogy of the women composing phratry A in the above table, it is seen that Nungulla is the mother of Nabijerry; Nabijerry has a daughter Naboron; Naboron produces Nabungarty; and Nabungarty is the mother of Nungulla, being the sectional name with which we commenced, and this series is continually repeated in the same order. Every woman, therefore, takes the same sectional name as her great-great-grandmother, descent being invariably reckoned in the maternal line.

In examining the table it will be observed that the sons take the sectional name of their paternal grandfather. For example, a Jungurra

man begets a son Jabulgie by a Nungulla woman of phratry A. Jabulgie on attaining puberty marries Nackara, one of the women of the B phratry, and begets a son Jungurra, being the sectional name of his grandfather. The men who marry the women of the A phratry are the fathers of the men who marry the women of the B phratry, and *vice versa*. R. H. MATHEWS.

Deaths.—Since the publication of the last number of this journal, death has removed a number of eminent men whose researches in various fields of anthropology have been of world-wide importance. SIR JOHN WILLIAM DAWSON died at Montreal, November 19th, aged seventy-nine years. Although preëminently a geologist, his studies dwelt long on the borderland of the Science of Man, and several of his contributions to the subject have become classic. In 1860 he published "Archaia, or Studies of the Cosmology and Natural History of the Hebrew Scriptures"; in 1873 his "Story of the Earth and Man" first appeared, and it has since passed through many editions. Dawson's "Science and the Bible" (1875), "The Dawn of Life" (1875), "Fossil Men and their Modern Representatives" (1878 and 1880), were published in the order given; his contributions to periodical literature and to the publications of various scientific institutions are numerous and many of them highly important. The loss of Sir William Dawson is a serious one to the scientific world, and particularly will it be felt by the institutions with which he had been so long and so honorably associated.

Although perhaps more widely known through his contributions to ornithology and kindred subjects, DR ELLIOTT COUES, who died at Johns Hopkins Hospital, Baltimore, December 25th, aged fifty-seven years, did much to elucidate the problems in the ethnology and history of the regions covered by various early explorers of the Great West. Lewis and Clark, Pike, Thompson and Henry, Fowler, Larpenteur, and Garcés blazed the way through unexplored wilds, but the value of their labors was increased a hundred-fold by the scholarly treatment which their journals received at the hand of Elliott Coues.

WALTER JAMES HOFFMAN died at Reading, Pennsylvania, November 8, 1899, aged fifty-three years. Born at Weidasville, Pa., May 30, 1846, he was graduated from Jefferson Medical College, Philadelphia, in 1866, and practiced his profession in Reading until the outbreak of the Franco-Prussian war when he was commissioned as surgeon in the Prussian army. On his return to the United States he was appointed acting assistant-surgeon, U. S. army, and was detailed as naturalist to the Wheeler Survey during its explorations in Arizona and Nevada.

In 1872 he was ordered to Grand River agency, North Dakota, and detailed as surgeon of the Northern Pacific Railroad Survey under General Stanley. In 1877 he became a member of the Hayden Survey as ethnologist and mineralogist, and at the organization of the Bureau of Ethnology in 1879 accepted an appointment as assistant ethnologist. His researches led him among many Indian tribes, notably the Ojibwa and the Menomini, and his memoir on the latter tribe, published by the Bureau of Ethnology, was awarded honorable mention by the Loubat Prize Committee in 1898. Dr Hoffman's bibliography is extensive both in number and in scope. He was a member of many European and American scientific and historical societies, and until shortly prior to his death was United States Consul at Mannheim, Germany.

Other Recent Deaths : Dr Adolf Ernst, Director of the National Museum at Caracas, Venezuela, and author of numerous papers on the ethnology of that country. Dr Edward Petri, Professor of Geography and Anthropology in the University of St Petersburg, aged forty-five years. Mr James Simpson, curator of the anatomical museum of the University of Edinburgh. On October 25th, Grant Allen, author of "Physiological Æsthetics," "The Color Sense," "Evolution of the Idea of God," "Charles Darwin," "The Evolutionist at Large," "Force and Energy," etc.

Indian Canoe Making.— The material being ready, i. e., the bark, the ribs, and the slats, a suitable piece of ground is selected near a supply of water,— one that is level, preferably of clay, into which stakes, when driven, will remain upright and solid. The stakes are about three feet long and are driven into the earth fully eighteen inches. Two are fixed at each end, or where each end of the canoe is to be, and between these pairs two rows are driven corresponding to the "beam" dimensions of the intended vessel, the number depending on whether the canoe is to be one, two, or more fathoms in length. One of two fathoms long has, I think, seven stakes on each side, but the number of stakes also varies with the size of the pieces of bark, for if these are small, additional stakes are employed to support the joints. The stakes, of course, are driven into the ground in the form which the canoe is to take.

If the bark has been cut some months before, it is softened by steeping. Enough pieces are united with overlapping edges, by means of a stout twine, if it may be so called, made from spruce roots. The natural curve is of no assistance to the canoe maker, because the grain of the bark runs crosswise of the canoe ; moreover, the inner side of the bark is made the outer side of the work.

The two ends of this bottom strip, having been sharply doubled, are forced between the end stakes, and the united pieces of bark are slightly hollow all along in consequence of this doubling at the ends. A fire having been lighted close by, stones are heated, and these are placed in the hollowed bark which has meanwhile been filled with water. Very soon the bark has been sufficiently steamed to be forced downward between the stakes to the ground. Strips to form the upper portions of the sides are now added by the stitching method, and by the application of pine pitch to all the joints.

The ribs are next put in place. These are usually of cedar, from an inch and a half to two inches in width, and less than a quarter of an inch thick in the middle, lengthwise; toward the ends they become thinner, and throughout their whole length they are thinned on the edges. They are placed from a half to three-quarters of an inch apart, and between them and the bark are inserted slats, of the same material and similarly made, reaching the whole length of the canoe. Together these form almost a complete lining. They not only add stiffness to the boat, but they prevent injury by pressure from within. Gunwale bars are lashed through the bark inside and outside and over the ends of the ribs with spruce bark. The vessel is stiffened by three bars from gunwale to gunwale — one in the middle and one near each end — which are also bound with spruce-root thongs. The bars are light, the central one being about three inches wide and three-eighths of an inch thick in the middle and thinned toward the edges, the other about two inches wide and thinned similarly. Holes are bored in the ends of them to receive the thongs. DAVID BOYLE.

The Codex Cospianus, so named from its former owner, the Marquis Fernando Cospi (a Bologna patrician of the seventeenth century who formed a museum which he afterward presented to his native city), has recently been reproduced in facsimile by photochromography at the expense of the Duc de Loubat. The execution of the work is marvelously fine, and reflects great credit on the Danesi publishing house of Rome. The manuscript was first published in colors by Lord Kingsborough in the second volume of his *Antiquities of Mexico;* it is of the so-called pre-Columbian class, by which name are designated such Mexican manuscripts as show no trace of the Spanish conquest, and hence may be older than the Cortez invasion. A part of the codex is painted on the obverse and another part on the reverse only: some parts show pictures on both sides. The whole represents the work of two artists, one of whom performed his task remarkably well. The first part shows symbolic pictures arranged in little squares, thirteen in

each row, which is the number of days in the so-called Mexican week. Most of the squares are occupied by two figures only, and as there are two hundred and sixty squares, Professor Thomas has concluded that "this first part is a *tonalamatl*, applying to the 260-day calendar chart. This reads from left to right, beginning with the lower line and going up, like that of the Vatican codex, while that of the Borgian codex reads from right to left and from bottom upward. The *tonalamatl* of the Codex Cospianus appears to be much more symbolic or mystical than the other two mentioned. The day symbols vary more from the typical, as usual, and, moreover, each has an accompanying symbol, which probably has some reference to the nine 'lords of the night.' These symbols appear to be repeated at every ninth one, though somewhat varied in form." Professor Thomas also believes that, though belonging to the pre-Columbian series, the Cospi codex appears to be of more recent origin than the Codex Borgianus, as it introduces the dots and lines in expressing numbers ; it is also incomplete, as there are but eleven of the larger legless sitting figures, this number corresponding with no known number in the Mexican time system. As to the signification of the single figures composing the *tonalamatl* or "book of life-signs," the appended Spanish "Description" is almost silent, and in most cases their meaning can only be surmised.

Another part of the codex (pages 9–32) is occupied by pictures of warriors or war gods, monsters, houses or temples, or by a single human figure, all in bright colors, beneath which are numeral signs, chiefly of the numbers six, seven, eight, and nine. These marks seem to give a chronologic character to the whole work, which, when fully understood, will be of great literary and ethnologic interest.

An inscription states that the codex was presented by Valerio Zani to the Marquis Cospi, December 26, 1665. It now belongs to the University Library of Bologna.

A. S. GATSCHET.

Sir Hans Sloane was a born collector, possessing in high degree the habit of accurate observation and recording so necessary for the identification of objects and the preservation of information concerning them. It is well known that his collections and the house in which they were stored, bequeathed to Great Britain, were the nucleus of the British Museum. He was physician to the Duke of Albemarle while the latter was Governor of Jamaica at the close of the seventeenth century. His *History of Jamaica* is a model for explorers and museum collectors. The volumes are in large quarto, with full-size drawings of plants, insects, and birds. The first volume was published in 1707,

and after a lapse of twenty years the second appeared. Sir Hans explains this delay by telling of his collection and the time and labor expended (out of his daily practice as a physician) in arranging, classifying, and labeling it. After listing many thousands of natural history specimens, Sir Hans continues—

Humana, *viz.* Stones of the Kidney and Bladder, Anatomical Preparations, and the like,

Miscellaneous things not comprehended with the foregoing, both Natural and Artificial,

Things relating to the Customs of Antient Times, or Antiquities, Urns, Instruments, &c.,

Large Seals,

Pictures, many relating to Natural History,

Mathematical Instruments,

Large Vessels, Handles, and other things made of Agats, Jaspers, Cornelians, Christals, besides many Camei and Seals, excisa, and incisa,

Medals, antient, as Samaritan, Phænician, and Coins in all Metals,

Books in Miniature or Colours, with fine Drawings of Plants, Insects, Birds, Quadrupeds, Fishes, and all sorts of natural and artificial Curiosities,

Books of Prints, &c.,

Volumes of Manuscripts, the greatest part of them relating to Physick, and Natural History, Travels, &c.

The etymology of "pickaninnies" or, as Sloane spells it, *piganinnies*, is given in his work. It is a corruption of *pequeños niños*, applied to the slave or black babies of Jamaica. THOMAS WILSON.

Borgiano Mexican Codex—Another very important Nahuatl manuscript has been reproduced for the use of students through the munificence of the Duc de Loubat. The Borgiano codex antedates the conquest of Mexico, and ranks among the very rare codices preserved in Mexico and Europe which are conventionally called pre-Columbian. It excels in size, and consequently in the richness of its pictorial text, all the others known, while in the integrity of its reproduction, including the preservation in facsimile of the original binding, it is equaled only by Vatican codex No. 3773, published also under the direction of the Duc de Loubat in 1896. Linguistically and ethnographically considered, the Borgiano codex is a Nahuatl manuscript from Anahuac; in regard to its contents, it is ritualistic, or, as P. Fabrega defines it, a historical, ritualistic, and astronomical almanac. It therefore differs greatly from the Maya and Zapotec, as well as from

the historical and tributary codices. The codex is the property of the ethnographical museum of the Congregation de Propaganda Fide at Rome, and was called Borgiano because it was once the property of Cardinal Stefano Borgia, who died in 1804. The facsimile reproduction of the original is so perfect that even the most minute details of the binding are represented. The material of the codex consists of a strip of the skin of a Mexican deer, 10 meters in length and 27 centimeters in width, and comprising fourteen pieces of varying length, glued together and prepared to receive the writing by means of a thin coating or sizing of transparent glue. The strip was folded in thirty-nine equal parts, one over the other, in the form of a screen, making a volume 27 centimeters high by 26½ centimeters wide. At a period subsequent to the completion of its pictorial text, the volume was covered with two thin boards, to which the two extremities of the strip were fastened with nails. The first three folded parts of the strip (pp. 74–76) have been slightly scorched. The text is written upon both sides of the skin. Like the Cospianus, the Borgiano codex was published by Lord Kingsborough, but it is hardly necessary to add that the Duc de Loubat's reproduction far exceeds the former in beauty, faithfulness, and freedom from arbitrary additions.

A. S. GATSCHET.

The Dresden Museum.— Dr A. B. Meyer, Director of the Royal Zoölogical, Anthropological, and Ethnographical Museum at Dresden, who recently visited the United States on a special mission from the government of Saxony, for the purpose of inspecting its museums and scientific institutions, calls attention to the omission, from the article on *The Anthropological Museums of Central Europe*, by Dr George A. Dorsey, published in the July, 1899, number of this journal, of reference to the museum under his direction. In a note, dated September 25th last, Dr Meyer says:

"Dr Dorsey, . . . speaking of the anthropological collections of Germany and Austria, mentions only those of Berlin and Vienna, entirely overlooking that of Dresden. I therefore take this opportunity of saying that the Dresden collection is the greatest public anthropological collection in Germany, covering over 2000 skulls, a great series of skeletons, busts, and samples of hair, besides possessing the most complete set of anthropometric instruments I know of."

Under date of October 26th, Dr Meyer supplements his previous note with the following information:

"The cases and desks wherein the anthropologic collection is exhibited are forty meters long, the cases three to four meters high.

There are about 40 skeletons of the races of the earth, chiefly from the East; about 2000 skulls, among them being about 500 Melanesians, 350 Philippine islanders (40 Negritos, and many deformed, from caves), about 130 criminals and insane, about 600 of the various European races, etc., besides many single bones from different parts of the earth. There are about 500 casts of busts, heads, skulls, brains, and single parts of the body, including 63 specimens of criminals and insane, about 150 of races, 120 of celebrated persons, etc. There are about 250 samples of hair from various races, chiefly Eastern, and about 50 anthropometric instruments of all kinds. The entire collection numbers about 3000 catalogued specimens. There are, besides, 73 osteological specimens of anthropoid apes."

Hindu Superstitions.—Mr M. R. Pedlow gives the following superstitions among Hindus in the Central Provinces, in the *Indian Antiquary* for February:

If sparrows nest in a house-eaves, or any one scribbles on the floor with charcoal, or spiders make webs on the walls, the owner will fall into poverty.

To guard children against the evil eye, their mothers disfigure them by applying lampblack to the eyes or make black spots on their forehead, cheek, or chin; but girls are usually tattooed, not marked in this way.

When children are attacked by the evil eye they show it by their appetite falling off. To remedy this, the mother takes salt, dried chillies, and charcoal and puts them into a pot of water colored with lime and turmeric. This is waved three times over the child, and then spilled on the ground, or the ingredients are cast dry into the fire with some of the child's hair.

Fruit and vegetable gardens and patches of cultivation stand in need of protection from the evil eye, or else their growth will be stunted, even if they are watered daily.

The owners of gardens take the following precaution: A scarecrow or some animal's bones or a whitewashed pot is set up in the plot.

Black or blue threads, or pieces of leather or cowries are also fastened to the necks or legs of the house cattle to avoid the evil eye.

On proof of pregnancy, the wife washes herself profusely, taking much care to avoid the shade of a man falling on her, in the belief that her child, if born, would take after that man in features, though not in mental character.

White Mountain Apache baskets are of many shapes and sizes and are of two varieties — the bowl basket, *tsa*, and the

olla-shape basket, *toose*. The Apache also make basketry water-jars coated inside and outside with mesquite gum. The bowls and ollas are made from willow. I have often seen the women coming from the river almost hidden by loads of willow. When they arrive in camp they strip off the bark and leaves and wrap the osiers into small bundles. The black patterns are made with the *Martynia* pod. It takes a great many of these pods to furnish one pattern, because for even a moderate decoration the only part used is a shred of black from the prong. The only tools used are a butcher-knife and a small awl. When the woman begins to work on a basket she soaks the willows in water to make them pliable, then strips off the fine splints for sewing by putting the end of the switch in her mouth and paring off the filaments with a knife. In this they are so expert that the strips are wonderfully uniform. They then prepare the small osiers on which to work the coil. They punch a hole with the awl for every wrap, and push the filament through, as in threading a needle, pulling it very tight. They piece out the splints very neatly in the bowl basket, and always end on the inside, terminating them with their knives. As soon as the basket is finished it is put into use. K. T. DODGE.

Dr Fewkes' Researches. — In a letter from Dr J. Walter Fewkes, he states that before going to Tusayan he remained a week in Holbrook, Arizona, to make notes, sketches, and photographs of a collection of two thousand objects of pottery, stone, bone, and shell from the region, formed by Mr F. J. Wattron. He says: "The collection is particularly rich in Homolobi specimens, and the pottery has a few new pictographs. The Sikyatki specimens reveal a most instructive cult which I had long suspected existed in that prehistoric pueblo, but had only fragmentary evidence of it. I hope the collection will find a permanent home in some institution." The enthusiasm with which Dr Fewkes entered his winter's work at the Hopi villages, with all its privations, betokens the true explorer, and no one doubts that the results will prove as valuable as his previous investigations in this field. WALTER HOUGH.

Anthropology in England.—In comparing the interest taken in anthropology in England and on the continent, *Nature* (October 19th) says: "As an example of the interest that is taken in anthropology on the continent, we call attention to the publication of the free courses of lectures delivered by Prof. E. Morselli, at Turin and Genoa. The title of the publication is 'Antropologia Generale: Lezioni su l'Uomo econdo la Teoria dell' Evoluzione.' When will it be possible for the

English public to hear systematic lectures on anthropology of any kind, free or otherwise?"

In its issue of December 14th, the same journal, commenting on the article by Dr G. A. Dorsey on "The Anthropological Museums of Central Europe," published in the July, 1899, number of the *American Anthropologist*, says: "It is clear that in the United States the study of ethnology is being pursued with the same enthusiasm as in Germany, and that it has succeeded in a similar manner in securing a large measure of popular support. Viewed in the light of these facts, the conditions of things in Great Britain appears doubly deplorable."

The Vai or Vei are the only negroes who possess a true and indigenous writing. They occupy a territory on the confines of Sierra Leone and Liberia. The alphabet is syllabic, and it is the only syllabic alphabet existing in Africa. The first account of this remarkable language was published by Forbes and Norris in 1849, and Koelle also wrote on it in 1849 and 1854. Since then nothing has been published thereon till the recent study of M. M. Delafosse (*Anthropologie*, tome x, 1899, pp. 129, 294). Forbes and Koelle asserted that the alphabet was invented about 1829 or 1839, but Delafosse considers it at least two hundred years old and perhaps older; it is not even certain that it was invented by the Vai themselves. Forbes was also wrong in stating that this alphabet was no longer in use in 1849; as a matter of fact, it is still increasingly employed. Of the 226 characters in the alphabet, 25 resemble Berber consonants in form, and 20 resemble European letters and numerals; but these may be purely superficial resemblances, as the sounds do not correspond. The author does not consider that the Vai alphabet has been derived from these sources.

An Ostiak Custom.— Mr William Tegg relates a custom of the Ostiaks who, desiring to test their women, give to them a handful of hair pulled from a bearskin. If the woman accepts the gift the man may be assured of her honesty and purity, for her belief is that if it were otherwise, the bear, whose hair was pulled, would return at the end of three years and devour her. THOMAS WILSON.

MINOR NOTES

DR G. A. DORSEY, curator of anthropology of the Field Columbian Museum, accompanied by an assistant and Rev. H. R. Voth, have returned to Chicago from the Hopi pueblo of Oraibi, Arizona, whence they departed December 6th. The aim of the expedition was to procure additional ethnological material, to witness the approaching

solstice ceremony in order to obtain suggestions for new groups, and to start a systematic and somewhat extended excavation for the purpose of strengthening the Museum's archeological exhibit from Tusayan. The expenses were covered by Mr Stanley R. McCormick of Chicago, who placed $5000 at the disposal of the Museum in addition to the $10,000 already expended on the Hopis. The splendid exhibit, which fills three large halls, is attracting many visitors. An account of the Voth collection was given in the *Anthropologist* for April last.

THE UNIVERSITY OF PENNSYLVANIA'S Free Museum of Science and Art at Philadelphia, one of the late Dr William Pepper's cherished hopes, was formally opened on December 20th in the presence of several thousand people. Immediately following the presentation to the board of trustees of the museum, a bronze statue of the late Dr Pepper, the gift of friends, was unveiled. The presentation speech was made by ex-Senator George F. Edmunds, in behalf of the Dr Pepper testimonial committee. In connection with his address, Dr Edmunds was delegated by Mrs Frances Sergeant Pepper, the widow of Dr Pepper, to present to the university trustees, as a memorial to her husband, a gift of $50,000 to continue the work which Dr Pepper commenced.

THE THIRTEENTH LECTURE COURSE on science and travel at the Field Columbian Museum will be given during March and April. Those of anthropologic interest are: March 24, "Primitive American art with illustrations drawn chiefly from studies in aboriginal games," by Mr Stewart Culin; March 31, "Archeological discoveries on the North Pacific coast of America," by Mr Harlan I. Smith; April 7, "Soyaluna, a Hopi winter solstice ceremony," by Rev. H. R. Voth; April 28, "Indian tribes of the great plains," by Mr James Mooney.

ARCHEOLOGICAL EXPLORATIONS were conducted about Long Island sound and lower Hudson valley during last season by Mr M. Raymond Harrington, in the interest of the American Museum of Natural History. The researches have brought to light a number of Indian burials as well as specimens from shell-heaps. Mr Marshall H. Saville, of the American Museum, left New York in the latter part of December for the purpose of carrying on excavations at the ruins of Xoxo for a season of three months.

SWISS LAKE SKULLS.—M. E. Pitard describes in *Anthropologie* (tome x, 1899, p. 281) three crania from Swiss Lake sites. The first, from Point, with an index of 91.5, belongs to the Rhetian or Dissentis

type, and is remarkably similar to a skull described by M. Verneau from Concise, which that author believed to belong to the bronze age; but M. Pitard asserts that his example is neolithic. The other two crania were found in the same layer at Concise, and are of the bronze age; their indices are 77.6 and 84.6.

THE FOLK-LORE SOCIETY of London, it is stated, has placed on permanent deposit in the Museum of Archeology and Ethnology of Cambridge University a collection consisting of more than 600 objects illustrating the folklore of Mexico. The collection, which was made in Mexico by Prof. Frederick Starr of the University of Chicago, was exhibited last June at a joint meeting of the Folk-Lore Society and the Anthropological Institute.

THE VALUABLE LIBRARY relating to the American Indians collected by the late J. Hammond Trumbull has been acquired by the Watkinson Library at Hartford. Dr Trumbull's manuscript Natick Dictionary, compiled mainly from the various translations of John Eliot, has been presented to the American Antiquarian Society at Worcester, and steps have been taken toward its publication.

THE FOUNDATION of a chair of American Archeology at the University of Berlin by the Duc de Loubat, has given a great impetus to the development of the teaching of anthropology at that university. Recently it has been announced that Dr Adolf Bastian has been made Professor Ordinarius of Ethnology. This has been followed by the announcement of the appointment of Dr Felix von Luschan as Professor (extraordinarius) of Anthropology.

A COMMITTEE, consisting of Mr James E. Scripps, Mr George W. Bates, of Detroit, and Prof. Francis W. Kelsey, of the University of Michigan, was appointed at the annual meeting of the Detroit branch of the Archæological Institute of America, and was instructed to name a general committee to prepare a memorial to be submitted to the next State legislature on the subject of an archeological survey of Michigan.

THE AMERICAN ARCHÆOLOGIST, formerly *The Antiquarian*, of Columbus, Ohio, has been purchased by *Popular Science* (not *Appleton's Popular Science Monthly*) of New York City, and will be merged into and become a part of the archeological department of that magazine conducted by Mr Warren K. Moorehead, assisted by Messrs J. F. Snyder and A. F. Berlin.

MR GEORGE BYRON GORDON started for Central America, December 5th, on an archeological expedition under the auspices of the

Peabody Museum of Harvard University. Arrangements have been made by which explorations will be renewed at the ruins of Copan, where the Museum has done much important work during previous years.

By the will of Thomas Armstrong, of Plattsburgh, N. Y., Union College is to receive between $100,000 and $150,000. It is required that the college shall endow a chair of sociology and offer a certain number of annual prizes and scholarships for the sons of Clinton County farmers.—*Science.*

The Archeological Society of Moscow has established "an archeological commission" (i. e., an Historical Manuscripts Commission), according to the *American Historical Review*, the function of which is to print reports on the contents of the lesser public and private archives of Russia.

Mrs Elizabeth A. Johnson, of White Rock, Republic county, Kansas, has donated to the Kansas State Historical Society eleven acres of land, embracing the site of the Pawnee Indian village where Capt. Zebulon Montgomery Pike, in 1806, first raised the American flag on Kansas soil.

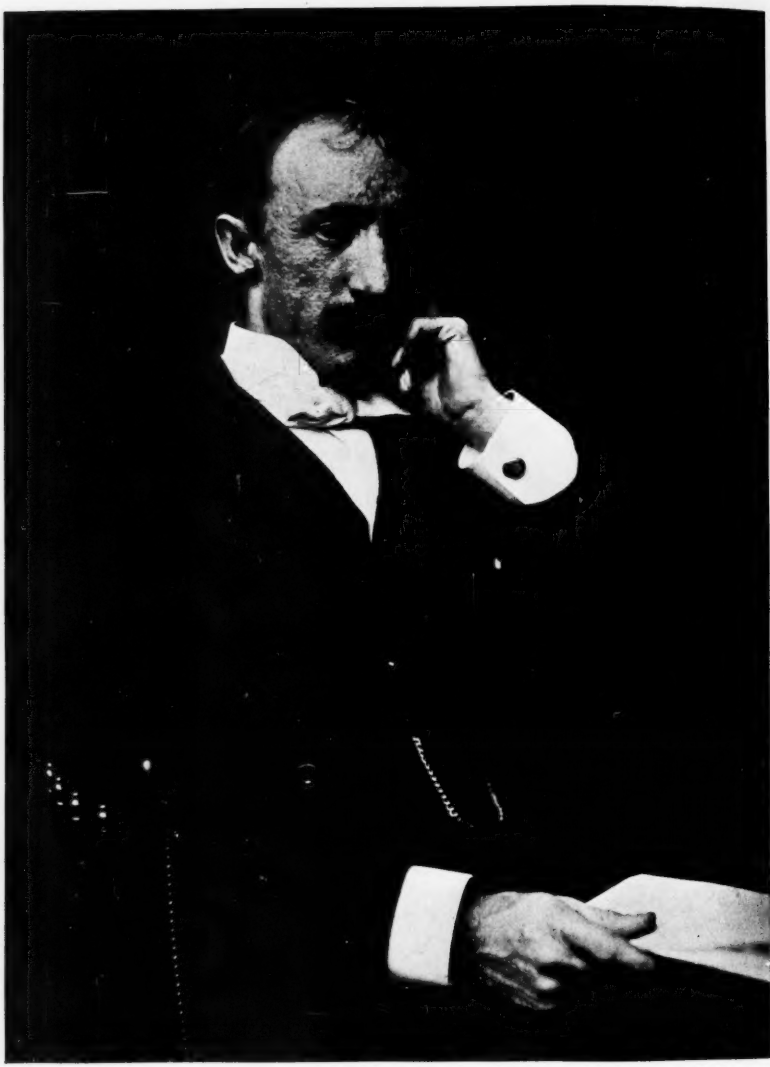
Anthropological Institute.—At a meeting of the Anthropological Institute of Great Britain and Ireland, held January 30th, Mr C. H. Read was elected president, Mr A. L. Lewis treasurer, and Mr J. L. Myres secretary for the ensuing year.

Dr Merton L. Miller, author of an interesting and instructive "Preliminary Study of the Pueblo of Taos, New Mexico," Chicago, 1898, has been appointed to an associateship in anthropology in the University of Chicago.

Dr Daniel P. McMillan has received an appointment in the Child-study Department recently established in the public schools of Chicago.

Mr W. L. H. Duckworth has been appointed to the University lectureship in physical anthropology, Cambridge, England.

The dignity of a peerage has been conferred on Sir John Lubbock, Bart.



FRANK HAMILTON CUSHING